# FOOD MANUFACTURE

Incorporating Food Industries Weekly

ARD HILL LIMITED, 17, STRATFORD PLACE, LONDON, W.1 — AUGUST 1, 1949

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# FOOD MANUFACTURE

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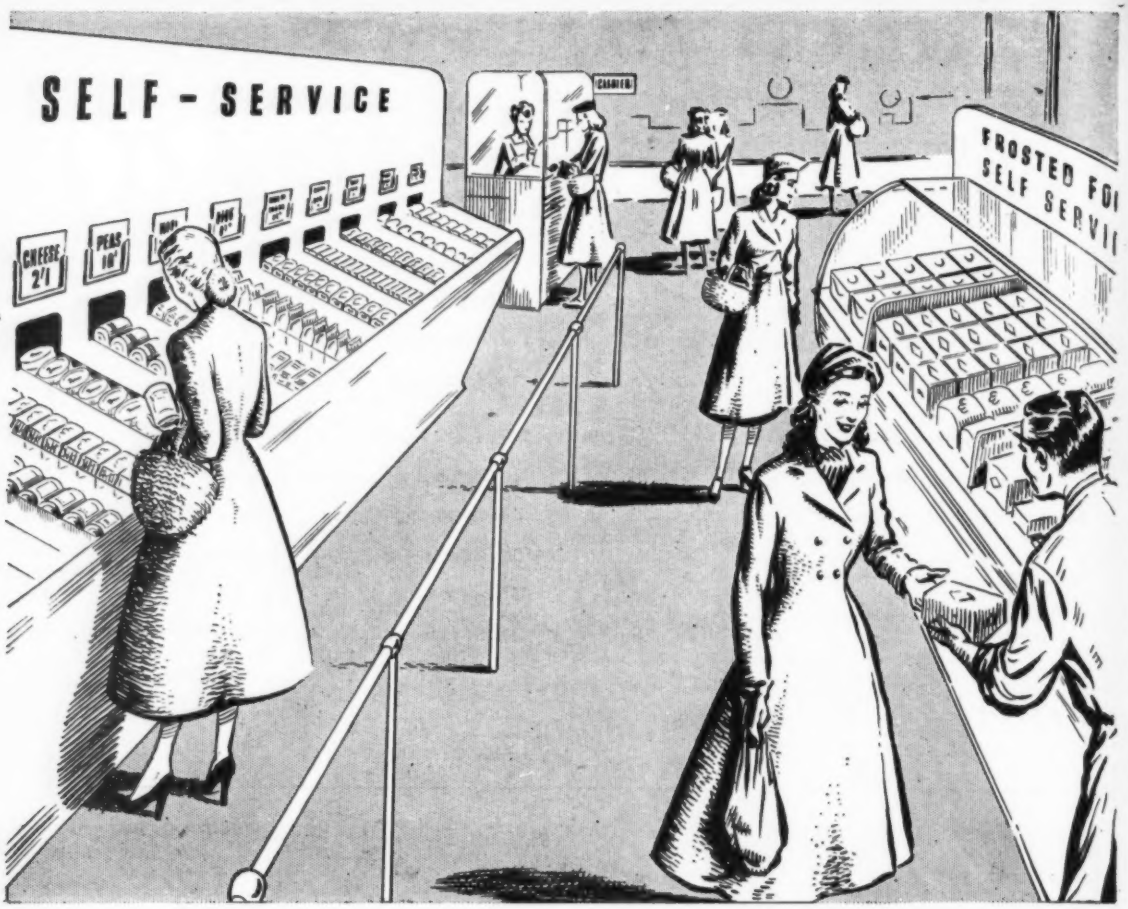


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# FOOD MANUFACTURE

Vol. XXIV, No. 8 August 1, 1949

## *The Pig Position*

IF the pig numbers of Canada had not declined, while pigs in the United States were beginning to teem, we might have foreseen, later in the year, a further difficulty with offshore dollar purchases. As it is, the demand in the States for Canadian beef, usually at a higher price than Britain is prepared to pay, has meant a pressure among the Canadian consumers on their own domestic supplies of pork; and it is anticipated that the American tourist traffic this summer will take up the Canadian surplus. There may be relatively little left to wait upon the British market, unless indeed this year's harvest of maize and barley is of such dimensions that the Canadian pig numbers show a rapid rise.

There is little doubt but that the Canadians would welcome a long-term agreement with Britain on their pig products, extending the principle of the wheat agreement. It is always easiest to dispose of a surplus of coarse grains and offals by converting them into pork and bacon, though it may not matter much ultimately whether the conversion takes place on Canadian or British farms. But the dollar problem makes such an agreement a very questionable proposition; and for our own Government the Polish, French, and Danish markets may offer a better prospect.

In the meantime, while our bacon ration remains low, the Canadians have deliberately cut back on their pigs. A pig population, that reached more than eight millions in 1943, had declined by June 1947 to 5,400,000. By June 1948 the numbers were down to 4,400,000. Since then further shrinkage has been reported; and it is conjectured that the numbers may now be below the 1939 level of 4,200,000.

It seems probable enough that some of this decline has been prompted by an anticipation of inconvenient American surpluses in the near future.

In 1947 the British markets took practically the whole of the Canadian exportable surplus of bacon; and a serious American competition for this market, especially if backed by Congress, might well have made Canada's bacon position extremely difficult.

As for the States, they are faced with a repetition of the surplus problem of the early 'thirties; and they may try the same remedy. The problem, in other words, turns out on analysis to be less one of a saturated consumption than one of high prices and unemployment. In 1934-5 a considerable proportion of the food used in direct relief to the unemployed families consisted of the surplus pork that would otherwise have had to be destroyed out of hand. It seems probable that a "New Deal" remedy of this kind will be invoked to absorb some of the present glut. Dumping pork into the sea is scarcely likely to appeal to world sentiment, at a moment when half the countries of Europe are writhing beneath their dollar shortages. Yet, that maize is being now converted into pig meat at an alarming rate appears to be one of the more intractable of the problems facing the U.S. Secretary for Agriculture.

## *Dollar Exports Board*

In the April issue of FOOD MANUFACTURE was given an abstract of the report of the United Kingdom Engineering Mission, 1948, which was sent to Canada last year by the Board of Trade to investigate the openings for more engineering equipment exports to the Dominion. Its report was a call for action, and action has promptly been taken. Upon the foundations which were laid by Sir Clive Baillieu and his colleagues has been erected the Dollar Exports Board. This is not a Government enterprise, although it will have the goodwill and backing of the present Government, and doubtless of whatever Government follows, for this is not politics but business. "It is," according to the chairman, Sir Graham Cunningham, "in the belief that the interests of the United Kingdom and of Canada and the U.S.A. are to a very great extent complementary, and will be recognised as such on both sides of the Atlantic, that the Dollar Exports Board is established."

Elsewhere we give a list of the eminent business men who constitute the Board. They are all much occupied men, and they are all giving their services gratuitously. Some will give their full time to it, arranging with colleagues to cover their important business affairs while they are engaged on this task. The Board has been formed entirely by British industry, commerce, finance, and organised labour. It is being financed by industry; but the Government departments concerned, especially the Treasury and the Board of Trade, have promised full co-operation in the work.

On April 26 last it was decided to make the first move to set up the Board. This decision was approved the same day at a meeting of industrialists, bankers, merchants, and traders, held at the Board of Trade, for the purpose of considering the problem of the balance of trade between the United Kingdom on the one hand and Canada and the United States on the other. All present at that meeting agreed it was a matter of great importance at the present time (and would become even more important in the years ahead when the funds generously provided by the U.S.A. and Canada under Marshall Aid and the Canadian Government credit will have been expended) that U.K. exports to Canada and the U.S.A. should be developed to the utmost. This is vital to the economy of the United Kingdom and is of the greatest urgency. It is of almost equal concern to Canada and the U.S.A. since nothing less than a substantial increase of United Kingdom exports can assure a continued purchase by Britain of their products.

The function of the Board is to provide a focal point for the endeavours which many different interests clearly wish to make towards achieving a dollar balance, and so avoid the calamities which will arise if the United Kingdom cannot buy urgently needed supplies from dollar countries. The Board intends, in addition to assisting the removal of some of the obstacles to the development of exports, to promote new activities in the Canadian and U.S.A. markets, to make suggestions as to methods of marketing, and to examine fresh means whereby dollars can be earned. It will also ascertain whether new facilities and aids for exporters can usefully be provided by the Government, by co-operative action in industry, or by financial agencies. It has, be it well noted, no intention of duplicating the work or trespassing uninvited on the field of industries with established marketing arrangements in Canada or the U.S.A. It will, wherever possible, work through existing organisations, and, where necessary, form special groups or committees with the approval of the industrial or commercial interests directly concerned. The Government has promised that representations made will at all times be considered with sympathy and urgency. May success attend the work of the Board.

## *No Night Baking in Australia*

That leaders of the British baking industry should form a delegation to attend the forthcoming conference to be held in Sydney in the latter part of October was urged by Mr. J. H. Tucker, managing director of Procera Australia (Pty) Ltd., during his recent visit to Great Britain. Not only would they be able to see how Australians tackled the difficulties common to bakers all over the world, but, in particular, they would be able to see how the problem of the elimination of night baking—a controversial subject in Great Britain—has been satisfactorily overcome.

Australian bakers start their day at 5.30 with the exception of the doughmaker, whose day begins at midnight and who receives a higher rate of pay. Delivery vans are away not later than 8.30, ninety per cent. of Australia's bread being home delivered.

Transport of bread is effected by a variety of methods ranging from the horse-drawn vehicle in the bigger cities to air freight and rail. One instance of long-distance delivery mentioned by Mr. Tucker was to a small settlement 800 miles away from the nearest bakery.

In Australia emphasis is laid more on the machinery than on the man, as is shown by the legislation which has been passed in South Australia whereby breadmaking other than by mechanical means is not permitted.

On the research side, the visit of Dr. Kent-Jones two years ago to advise the trade on the question of setting up an Institute on lines similar to the British Baking Industries Research Association and to make recommendations regarding laboratory equipment has culminated in the opening of the Bread Research Institute of New South Wales which is financed by the bakers' voluntary contributions. Any of the States are eligible to take advantage of the services offered by the Institute, and it is hoped that its formation will do much to solve the problem of staling which is one of Australia's biggest headaches.

## *Bacon Distribution*

Distributors of bacon declare that the time has arrived when, in the national interest, the marketing of this product should revert to private channels. It is said that the Ministry of Food is spending £18,000,000 annually in doing the job very inefficiently and that Danish bacon intended for immediate consumption is being put into cold store for periods up to two months and when released has not only lost condition but is so slimy that it must be washed before despatch to the retailers. The result is that this bacon, for which the Ministry pays more than 2s. per lb., is really worth only a fraction of that price when it reaches the consumer.

Canadian and home-cured bacon are handled by the Ministry in the same manner. In some instances a complete cold store, instead of a single section, is being operated to cool a small quantity of bacon.

One member of the distributive trade described the Ministry's methods as "absolutely fantastic." He said that if distribution were allowed to return to the normal channels the public would receive their bacon in the condition in which it was intended to be consumed, and millions of pounds of the taxpayers' money would be saved annually.

## *Vitamins in Stored Canned Foods*

As early as 1924 the possible influence of holding on the vitamin C content was recognised and a study by Kohman *et al.* (1924) showed that the antiascorbietic value of canned apples remained essentially unchanged during storage for eight months. Other early studies employing bio-assay techniques suggested that the vitamin C activities of canned citrus and tomato products also are stable during storage periods of several months. As rapid chemical or microbiological assay methods for determining vitamin values of foods became available, an active interest in the more exact establishment of the influence of storage on vitamins in canned foods gradually developed.

In a paper presented at the 112th meeting of the American Chemical Society by J. F. Feaster, Mardell D. Tompkins, and W. E. Pearce, further work on this subject was described. The authors came to the conclusion that canned foods are to be classed among the more stable categories of foodstuffs. However, it is well established that they are subject to some chemical and physical changes during storage. Of the vitamins, ascorbic acid and $B_1$ are affected to the greatest extent. In the first month after packing, any atmospheric oxygen entrapped in the can is consumed. During this period, ascorbic acid retention may be influenced by the type of product, amount of oxygen, and type of container (plain tin cans being preferable to glass containers or enamel-lined cans for some foods). Beyond the initial short storage periods, temperature is the most important factor from the viewpoint of ascorbic acid and $B_1$ survival. At temperatures from 37° to 43° C., at which canned foods may be held for very limited periods of time in civilian distribution or for longer periods in certain tropical military operations, vitamin destruction proceeds at a measurable rate. At 21° C., which may be near the average of year-round commercial storage conditions, ascorbic acid and $B_1$ retentions during one year appear to be in the region of 75 to 90 per cent. Carotene, vitamin D, niacin, riboflavin, and pantothenic acid retentions are reported to be even higher in the limited number of studies available.

The quality of canned foods as evidence by colour, flavour, aroma, and texture is also influenced by storage conditions. At moderate temperatures (21° C. or below) storage of most canned foods for one year does not appear to have any marked influence on quality. However, in the case of a few of the more susceptible products, changes in flavour under usual storage conditions may be of commercial importance. For such foods, refrigerated storage is indicated. Freezing has an adverse effect on the texture of some canned vegetables which results in downgrading. However, freezing does not affect the utilisation of these products.

## *U.S. "Climate Factory"*

A new world of agriculture, in which plants that never see the sun or feel the elements produce crops of incredible size and flavour, waits just over the horizon. Between that world and this, it is said, lie only a few years of experimentation—in a new "climate factory" at the California Institute of Technology.

It is the Earhart Plant Research Laboratory—a huge greenhouse with built-in weather and soil controls. Every kind of climate in the world which will support plant life can be reproduced in this 400,000 dollar nursery.

Known as the Phytotron, this laboratory will artificially re-create or eliminate all but one of the known factors in plant growth, such as soil, climate, insects, and sunlight.

The one factor which the Phytotron will not be able to control is cosmic radiation. "We

don't know any way to protect our plants or ourselves from these radiations," says the Director of the laboratory, "but we hope, by controlling all other factors, to learn exactly what are the results of their action.

"If we can tell in advance what plants will grow best in what climate, we should be able to increase the world's food supply even under current farming methods.

"Eventually, we may find it feasible to grow all crops in such laboratories. The increase in yield and flavour may well justify the expense. It is already true in the case of orchids."

As the word Phytotron suggests, it is not so much a greenhouse as a huge instrument for the study of botany. Its various rooms produce temperatures ranging from 35° to 88° F. Humidity can be reduced to 10 per cent., simulating desert air. Rain, and even smoke and fog, can be created by the turn of a valve on the huge instrument board in the Director's office.

## *Washing Up*

Salford's deputy chief sanitary inspector, Mr. J. C. Starkey, has been spending a holiday in a caravan in North Wales. That in itself does not savour of the "man-bites-dog" type of news, but it seems that during his vacation Mr. Starkey was called in to help with that dreariest of household chores—washing up.

Not finding his duty a pleasant one, he set about finding some way of eliminating the tiresome task. He hit upon the idea of cutting up squares of greaseproof paper with which he covered each plate; after eating all that remained to do was to wrap up the used paper and destroy it.

The story was related to some of his colleagues and eventually reached the ears of the Medical Officer of Health, who seemed in favour of the innovation; in fact, he even went so far as suggesting that the greaseproof paper could be made in some attractive doyley form.

We find it rather difficult to work up any enthusiasm about this so-called labour saving device. Without wishing to detract in any way from Mr. Starkey's inventive genius, one or two points present themselves. To eat, Mr. Starkey still presumably uses utensils; to drink, Mr. Starkey still presumably uses the cup and saucer or glass; to cook, Mr. Starkey still presumably uses some such device as a pot or pan. Supposing this to be the case, he only lessens the washing up drudgery by the number of plates used.

Further, we can see Mr. Starkey's "roast and two veg." reading "roast, two veg., and greaseproof paper."

Nevertheless, the thought behind the discovery will perhaps encourage others to sit down and think out a more practical and economical method of eliminating dirty dishes.

## *Brighter Outlook*

Farmers and food growers should find much interest in scientists' reports telling how slowly but surely our climate is improving. There are historical records of a "little Ice Age" a few centuries ago, a zero from which, despite some fluctuations, glacier ice seems to have slowly retreated.

In a recent issue of *The Geographical Journal* Professor Ahlmann of Stockholm has summed up the evidence. Glacier ice has thinned and shrunk since it reached a maximum (in this case 200 years ago), retreat being in evidence in Iceland and S.W. Greenland where mediaeval farming land is now exposed, while in Alaska the last forty years have seen retreat averaging 400 metres a year. Polar Sea ice has lost more than a third in thickness. Cod, at one time never seen near Greenland, has migrated along with haddock, herring, and halibut, while even the birds have followed the sun—northwards!

Barley grows in Iceland, mountain pastures grow higher in Finland and Sweden, and forests improve in Scandinavia. As for bleak Britain, on a latitude east of Labrador and benefiting, long before Marshall Aid, by virtue of the Gulf Stream permitting us to grow half our food, we shall await results as northern ice packs retreat. A learned professor lecturing in America promised us semi-tropical flora and fauna should those ice packs be thawed out with the atom bomb. It looks as if we shall benefit in any case from Mother Nature's curious ways!

## *Echo from the Food Group Tour*

To the fair land of France I came
And, by the irony of fate,
While waiting for a steak to cook
Was pressed to try an "English plate."

"No, no," said I; "*Mais, oui,*" said they
And forthwith brought a laden dish
Of luscious ham "*de Yorck*" with tongue
And all the trimmings heart could wish.

A snack with the aperitif—
That's all they said. Roll on the day
When we shall see so much so good
On menus under "*plat Anglais*"!

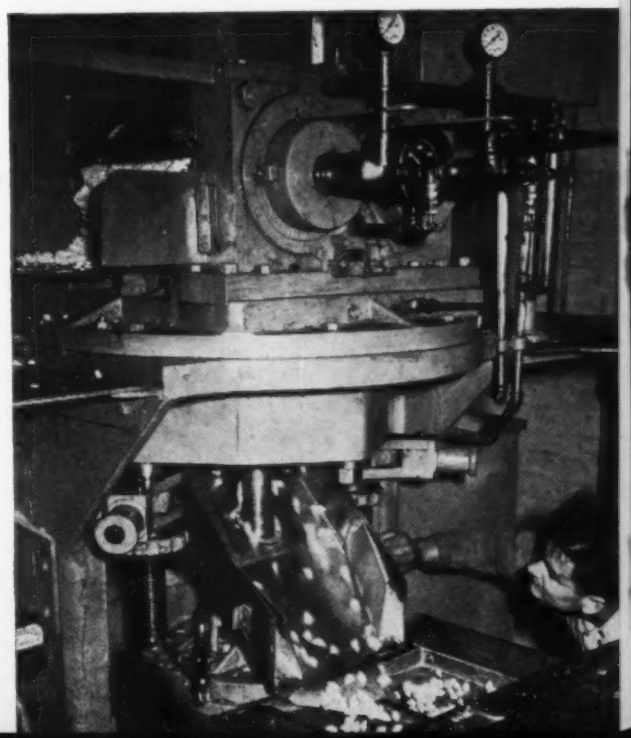
# Problems in Macaroni Manufacture

J. A. RADLEY, M.Sc., F.R.I.C.

Some of the many different macaroni cuts.

The manufacture of macaroni in Britain is a comparatively young industry which expanded very appreciably during the early war years. Before the war only a few well-established firms were engaged in the manufacture of alimentary pastes, as macaroni, spaghetti, vermicelli, and other macaroni products are termed. The majority of these firms produced the dry products for sale, but some firms consumed their output in making further products of which macaroni or spaghetti were components, such as tinned soups, spaghetti and macaroni in tomato sauce, etc. The number of firms engaged in this industry at one time rose to the sixty mark but now number just over forty with outputs varying from 5 tons per week to 20 tons per day.

THE raw material of the trade is semolina from the amber durum variety of wheat. This wheat is imported from America and Canada by the Government and allocated to millers for the manufacture of semolina, who re-allocate it to firms in the trade. The millers have to mill to a 70 per cent. extraction rate, which produces a "specky" semolina even with the exercise of the greatest care in the milling process. Such an extraction rate leaves the miller no latitude or margin of safety. To obtain a good, practically speck-free semolina, which is desirable for producing translucent, amber-coloured products, an extraction rate of not more than 62·5 per cent. is desirable. Thus, the British macaroni trade starts off at a considerable disadvantage as compared with American and Canadian producers. The latter also have another advantage in that they have the choice of Grade One or Grade Two durum wheats, whereas the material distributed to British millers is ranked as Grade Three and often includes material which would not have received a grade before the war.

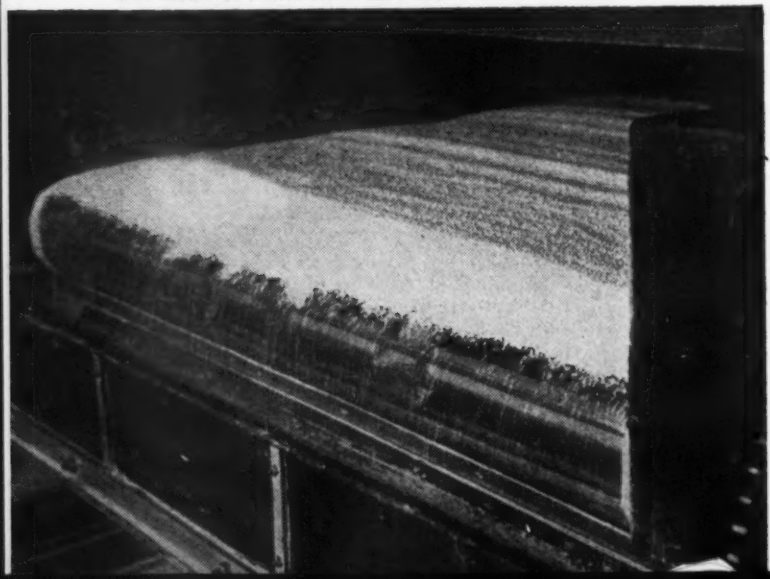


The press-mixer in operation.

A view of the press-mixer from above.

In view of the variability of raw material, and the lack of "know-how" which was general to the industry at the time of its expansion, it is surprising that the products on the market reached the standard of quality which they did. With a considerable shortening in the consumer demand the poorer class products are going to be hard hit as far as sales are concerned. Unless their quality is drastically up-graded, there is every indication that a price-cutting war may develop which would be disastrous to the industry. Last year the existing output of macaroni, spaghetti, vermicelli, noodles, and "mock" rice was sufficient for the demand, but latterly the demand has fallen despite the excellent propaganda on nutritional values, methods of preparation, and other sales-promotion devices carried out by the British Macaroni Institute.

The macaroni leaves the main drier.



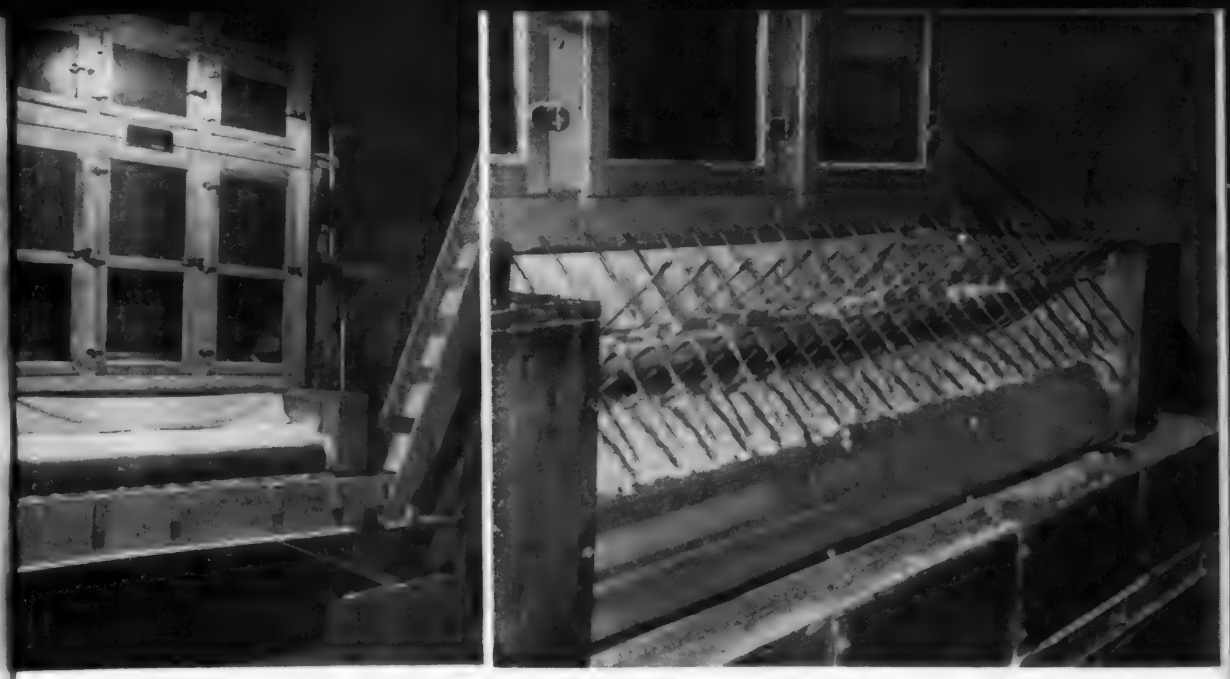
## Historical

The Italians, having learnt the art from the Asiatics, were the first Europeans to manufacture macaroni some time during the fourteenth century, and held the lead in the fields of production and consumption for some centuries. Before the reign of Louis XIII production had commenced in France, the material being made by hand. The first semolina mills in France were erected in the middle of the nineteenth century and later others were built in North Africa. The first mechanical process for manufacturing macaroni appears to have been perfected about 1800. In America macaroni was first made, on a very limited scale, in about 1860, but large-scale production was not reached until 1870. By about 1900 the industry had begun to assume real commercial importance, and today turns out large tonnages of first-class products.

## Raw Materials

Durum wheat is the preferred raw material. This variety is very hard, much harder than red spring and winter wheats, and its flinty characteristics render it highly suitable for semolina manufacture. Durum wheat has a tendency towards a higher protein content than bread wheats, which may render macaroni products of considerable importance in the cost of national dietaries since, in most countries, proteins form an expensive ingredient of the diet. Durum wheat is not suitable for breadmaking, partly due to its high content of yellow pigment. This pigment may give durum wheats a slightly better food value than bread wheats (Alsberg). From the nutritive point of view, macaroni products made from durum wheat have long been regarded as eminently suitable for inclusion in the diets of invalids and small children owing to the ease with which they are digested. In this connexion it may be of interest to note that durum starch is more readily attacked by enzymes than is the starch from bread wheats.

Excluding Canada, America, and European countries, macaroni has been made from a wide variety of natural grains in various countries throughout the world. Thus potato, maize, rice, wheat, rye, barley, oats, soya bean, and the ground particles of other farinaceous substances have been, or are, employed. Special



**General view of the receiving end of the drier showing the elevator for removing the product.**

**Finished macaroni leaves the final drier screen for conveyance to the packing tables.**

techniques are required for these materials, which normally leave much to be desired from the quality point of view.

### Manufacturing Process

The manufacturing process can be divided into the minimum of three steps: mixing, extruding, drying. Other steps may be introduced according to the materials used, the machinery employed, and the manufacturer's own modifications in his process. At each stage of the process certain factors have to be watched and controlled very closely to obtain a good final product, since a fault developing in any particular stage may be carried through, and even increased by, subsequent processes. Alternatively, if a fault is seen to develop during one process, suitable adjustments may sometimes be made to a following process in order to minimise or eliminate its effect on the final product.

The manufacture of alimentary pastes in outline is a simple one. Semolina is mixed with water, extruded under pressure through a die, and the extruded product dried in a current of air. Despite the apparent simplicity of the process, however, a considerable degree of art and technical control is required to produce the perfect article. In the case of macaroni, spaghetti, and vermicelli "long-goods," the perfect product should be translucent and free from cracks, be capable of considerable flexing like a fencing foil, a clear amber in colour, reasonably free from specks, breaking with a clean glasslike fracture, and having a smooth, matt outside surface. On cooking it should not disintegrate, but should swell to approximately three and a half to four times its original volume and have a firm but tender texture.

### Mixing Operation

Some manufacturers mix the semolina, mechanically, in large bowls, with the desired amount of water, after which the mixture is manhandled straight into the extruder. Others, using similar apparatus, knead the mixture either through toothed rollers or in a kneader resembling a melangeur with a toothed roll. This step is sometimes followed by a "rest" period, which is considered to take the "strain" out of the dough. There are both advantages and disadvantages in all these techniques, and the course pursued invariably follows the dictates of the manufacturer's own domestic policy.

The modern machines are more automatic in action, which tends to allow the manufacture of a more uniform product from batch to batch. The semolina and water are automatically fed into a mixer in the desired proportions and move towards and through the extruder at a constant rate. In the latest machine the strands are automatically cut to length and spread upon racks ready for the drying process. The temperatures in the mixer and in the extruder can be controlled within fairly close limits and are chosen with due regard to the plasticity of the paste, which is controlled by

**Careful control of relative humidity is essential to the manufacture of a first-class product.**

the water absorption of the semolina and the amount of water added.

An important point in the mixing process is to keep to a minimum the formation of minute air bubbles in the mass since these have an effect on the final colour and appearance of the goods, numerous minute bubbles giving a large light scattering effect which tends to make the product look "whiteish."

A really stiff dough is required for macaroni and an even stiffer one for vermicelli, the amount of water added being about 25 per cent. on the weight of the semolina in the former case. The temperature of the water is adjusted to the preference of the manufacturer. In South America boiling water is used by some firms. In Britain slightly warm or cold water appears to be the rule. Mixing temperatures on the high side have been operated in some continental factories. In one factory the water and semolina are mixed, the temperature of the water being such that the mix produced has a temperature of 104° F. to 122° F. The mix is maintained between these limits for fifteen minutes and then extruded. The temperature of the mixing is adjusted according to the quality of the gluten in the semolina, as judged by the Brabender or Berliner method, low quality gluten being treated at the lower temperature. Other factories maintain the mix, during mixing, at a temperature of approximately 148° F., and the high temperature is claimed to be of special importance when flour alone is being used. Incidentally, although flour is used on the Continent and quite good products are obtained from it, its use in alimentary paste manufacture is not allowed in Britain.

### The Extrusion Process

After mixing the water and semolina, the dough is extruded through dies in a macaroni press. There are, broadly speaking, two types of press. In the one a plunger, worked by either hydraulic force or a differential screw, moves forward in the pressure chamber and forces the dough through the die; in the other the dough is continuously fed in at one end, conveyed through the chamber, and forced through the dies at the other by means of a worm screw. This type is something like a large mincing or sausage-making machine. The hydraulic plunger machine is, of course, a batch machine, and after the end of the

**The finished macaroni is packed and weighed prior to distribution.**

plunger's thrust it is withdrawn and the chamber refilled with dough for the next extrusion or another filled chamber substituted. The screw-type machine is continuous and therefore more popular with manufacturers. It gives a very good product, although for the long macaroni some makers prefer the ram type.

With the first type of press adjustments can be made in the pressure exerted on the mass in order to minimise the effect of air taken in during the mixing process. In the second type, however, this is not so easy, but the method of automatic mixing tends to keep the air bubbles to a constant minimum. Further adjustment can be made by heating or cooling the die, which alters the plasticity of the mass and therefore the rate of extrusion and the pressure exerted on the dough, which affects the bubbles present—hence the appearance of the final product.

On leaving the dies of the extruder the material is often submitted to a gentle blast of warm air to surface dry it and thus allow it to be more easily handled. At this stage the material appears as a fairly dry, stiff dough, which retains its form well and is readily handled provided reasonable care is exercised. From this point there are more ways of damaging the product than there are of improving it.

**Drying Process**

From the time the product has passed from the inside of the extruder chamber to the first step of the drying process it has lost about 5 per cent. to 6 per cent. of moisture, and the dry-looking product is spread on racks or trays and put into the drying room. Here it may be dried still further for a short period by means of a current of hot air, after which it is "sweated" for some time. The term "sweating" is applied to the operation in the drying cycle where the air flow is cut off and the relative humidity of the air in the drying room is allowed to rise very high.

During the "sweating" period the moisture gradient in the product evens out, water travelling from the damp material in the interior to the drier material on the outside of the product. Certain chemical reactions, also, probably take place during this period, leading to the liberation of more "free" water. After sweating the material appears damper than at the start of sweating and may appear damper than when first extruded. The fans are next started again and the air passed over the goods and recirculated continuously, but at the end of each circulation some of it is "bled-away" to waste and fresh, drier air is admitted so that the relative humidity of the air can be kept either constant or raised or lowered in any desired manner.

This careful control of relative humidity is most essential in the manufacture of good macaroni. If the air is just passed over the goods in an uncontrolled manner until they are dry they may appear to be a first-class product as they emerge from the drier. Within a few days or weeks of being manufactured, however, the internal stresses and strains set up in the goods during drying take effect and the whole product "crazes" or becomes a mass of cracks. It may even entirely disintegrate into fragments. A similar state of affairs can be produced with a perfectly good product if it is stored in a place subject to extremes of temperature and humidity, since macaroni will rapidly adjust its moisture content to be in equilibrium with that of the surrounding atmosphere, and if the changes take place too quickly the internal strains set up can cause severe cracking. A high humidity during storage is also undesirable from the point of view of its effect on colour and also the possibility of mould growth occurring.

The various steps in the manufacture of macaroni all present their own problems, but scientific attack on these, started by the Americans, is now being followed up in this country with a view to determining the underlying fundamentals of the various processes. When these are all thoroughly known, the manufacturers of first-class products will be in a much stronger position to improve and maintain the quality of their goods even with inferior sources of material. The steady market which already exists for these pastes can be extended by increasing the export trade when the British products are made equal to or better than their American counterparts.

## Vitamin Emulsions with Glycerine

METHODS whereby oils or fatty materials may be emulsified in glycerine to provide stable, non-aqueous emulsions by incorporating small amounts of alcohol-soluble proteins commonly known as prolamines are described in a recent U.S. patent. The glycerine base, which is non-toxic and substantially tasteless, except for its sweetening effect, has been found particularly suitable as a vehicle for vitamins. Thus, not only are the fat-soluble types A, D, and E suitable for incorporation in glycerine, but also the water-soluble vitamins $B_1$, $B_2$, $B_6$, and other members of the B complex group, as well as vitamin C.

In such compositions the glycerine base may range from about 50 to 98 per cent. by weight, based on the entire composition. The amount of prolamine (*e.g.* gliadin and zein) necessary to achieve satisfactory emulsification ranges from a minimum of 0·25 per cent. to about 5 per cent. by weight, calculated on the glycerine base. In addition to the production of vitamin emulsions, vegetable and mineral oils may be finely dispersed in glycerine to yield stable, non-aqueous emulsions.

# Bordeaux Mixture

**The chorus of praise and satisfaction from the participants in the 1949 Food Group summer tour leaves no doubt of the success of the latest of these annual events. Bordeaux was the venue this year and a very full programme was carried out. A member gives some impressions of the visit.**

ON June 10 we were bade Godspeed at Victoria by the chairman of Council, Mr. Stanley Robson, Mrs. Robson, and Col. Griffin.

Paris lived up to expectations during a full day on Saturday, June 11. The Pasteur Institute visit was the first event of the tour, during which a lecture by Prof. Dubourg, read by M. Saunier, was given under the auspices of the *Syndicat National des Fabricants de Sucre*.

The afternoon presented the opportunity of sitting at pavement cafés, studying the nutritional habits of the French, and incidentally observing the old adage *quem in Roma*. . . .

In the evening a reception was given jointly by the *Société de Chimie Industrielle, le Conseil National du Patronat Français, la Fédération Nationale des Industries de l'Alimentation, la Fédération des Corps gras, le Comité National de Propagande en faveur du Vin,* and *la Société des Amis de la Maison de la Chimie*.

Some light relief was indulged in by a visit to the *Folies Bergères*—this was quite a well-attended session.

Most of Sunday we spent on the train, *en route* for Bordeaux. In the morning we were sorry to note that Mr. and Mrs. Bacharach had been obliged to return to London by air the night before.

*Line drawings acknowledged to Hervé Baille.*

As we viewed the country from the window of our carriage, we were interested to see the way dairymen dried their cans. The trees outside the dairies were pollarded and the cans placed on the stumps to dry. The racks rather resembled an enlargement of Granny's table ring stand. We saw a large number of horses in the fields, mostly more light than heavy types.

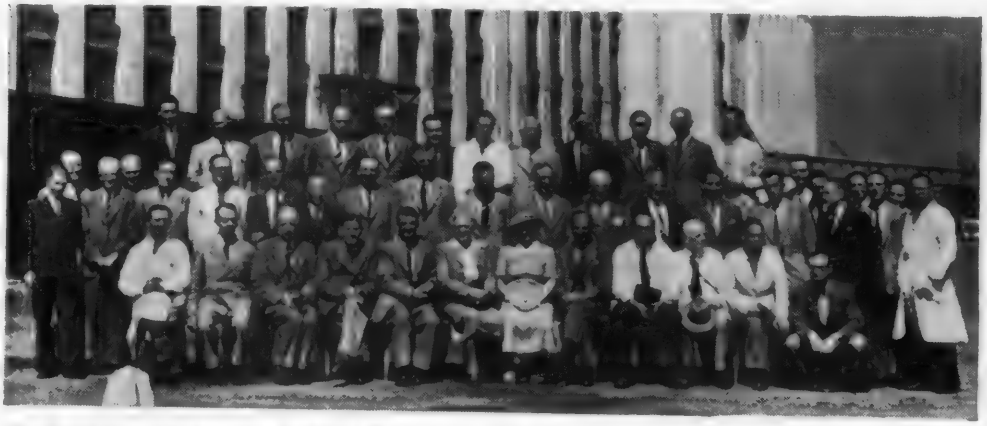
We were out bright and early on Monday morning for the tour of Bordeaux organised by the *Syndicat d'Initiative*. A handsome city—gay, lively, and full of charm. A city of science and art, a city of great antiquity in which are to be found the remains of an amphitheatre of the Gallo-Roman epoch; the *Palais Gallien;* the cathedral of St. André, a very fine specimen of the architecture of the eleventh to fifteenth centuries; and many other remarkable buildings of the Middle Ages.

An official reception by the Municipality of Bordeaux at *L'Hotel de Ville* occupied the morning.

The first industrial visit was to the *Grand Huilerie Bordelaise,* a large well-equipped refinery on the quay. Freighters dock within two hundred yards of it, and the oil seeds are pumped into tall silos equipped with overflow mechanism to large stores which are used in cases where the intake is greater than the capacity of the factory. At the time of our visit the refinery

Mr. and Mrs. Stanley Robson and Col. Griffin see the Food Group off.

Leaders of the French delegation at the Bordeaux Chamber of Commerce.



The Food Group and members of staff outside the Grands Moulins, Bordeaux.

A pleasant interlude, "al fresco."

Resting after a wine sampling session at Saint-Emilion.

was working on groundnuts, the treatment including pressing and solvent extraction. Eighty per cent. of the oil is extracted under pressure and 20 per cent. with solvent. The seed is first heated to produce what are called "butterfly wings," which somewhat resemble rolled oats. This is passed through granite rollers, and in some cases it is processed under heat more than once. Soya beans are also treated, in which case solvent extraction is used.

The Group had the honour of attending receptions by the local Chemical Societies and the Chamber of Commerce. At the former the party was received by M. Aussaresses of the *Académie Nationale des Sciences, Belles Lettres et Arts de Bordeaux*, and we listened to a speech by ninety-year-old Professor Denigés of Bordeaux University. At this meeting, on behalf of the Food Group, Dr. J. G. Davis was presented by M. Aussaresses with a commemorative medallion.

The Chamber of Commerce, joined by *le Syndicat de Fabricants d'Huile et de Torteaux, le Syndicat des Fabricants de Jus de Fruits*, and *le Syndicat des Grandes Industries Chimique de Bordeaux*, entertained us to a magnificent dinner. A brilliant speech by Dr. Hughes followed some witty addresses by our French hosts.

**Visit to the "Grands Moulins"**

Up again early on Tuesday morning for a visit to the *Grands Moulins*, where we were received by M. Fournier. This is an imposing modern mill, built near the Garonne, but as the water is shallow the wheat is brought in barges, and sucked on to a band conveyor to the silo, which contains thirty-two bins and has a capacity of over 10,000 tons, the intake being at the rate of 100 tons per hour. Damp wheats are treated on a M.I.A.G. drier. The screenhouse has much work to do as the screenings are heavy—up to 6 per cent. chiefly vetches. The roller mills are M.I.A.G. and there are five breaks. There is a Simon bran duster; all the purifiers are Simon and the plansifters M.I.A.G. A novel feature was the drying of germ by infra-red rays.

Much of the output is for the French colonies—72 per cent. extraction and specially dried to 9 per cent. to 10 per cent. For home consumption the extraction is 83 per cent. There is an admixture of 10 per cent. rye, and *creta praeparata* is added in the same proportion as in Britain.

The afternoon of Tuesday was taken up by a visit to the Médoc vineyards, from which proceed nearly half the fine red wines of the world. Among the *chateaux* visited were Calon-Ségur (Saint-Estèphe commune) and Mouton-Rothschild (Pauillac commune). It was the Baron de Brane who created the great wine of Mouton at Pauillac, which is today called Mouton-Rothschild.

A free evening spent by one member of the Group with a friend at the *Hotel du Chapon Fin* will long remain in memory. Naturally the *Filets Sole Chapin Fin*, with its cream sauce, was more or less what would have been expected, but the *pièce de résistance* was *Foie de Canard à la Périgourdine*. More memorable still was the bottle of Musigny 1915, served with due reverence by a wine waiter, whose appearance was as mellow as the vintage. The visual pleasure in its deep colour, and the subtlety of its bouquet savoured by nose and palate, brought to mind the last part of a quatrain from the Rubáiyát:

> I often wonder what the Vintners buy
> One half so precious as the Goods they sell.

One of the most popular visits took place on Wednesday—to the *Maison Marie Brizard et Roger*. This establishment produces the liqueurs which have been controlled by the same family since 1755.

**Saint-Emilion Vineyards**

In the afternoon we travelled to Saint-Emilion, which is a quaint old town set on the hills. We noticed a great difference between the vineyards of Médoc and those of Saint-Emilion. Médoc is a great alluvial plain with here and there small hills and valleys, but it is rare that the vines grow definitely on a hillside. In the Saint-Emilion country there is no estuary, but its place is taken by the Dordogne, a noble river. It is on the hillside facing the sun that the vineyards prosper, and there they have been since the days when the kings of England were lords of the land.

In Saint-Emilion, as elsewhere, it is the tradition of countless years which gives to the wine its particular excellence and its special virtue.

Thursday was the day of our visit to *Pampre d'Or*, a fruit juice

The bridge over the Garonne at Bordeaux.

Inside the Sports Palace at Bordeaux.

The big clock and gateway in the city of Bordeaux.

## BORDEAUX

A handsome city—gay, lively, and full of charm. A city of science and art. In September it is hard to find any important Bordelais business man in his native town. He has gone to his country estate to superintend the vintage in person and to make the most of that joyous festival which, since time immemorial, has been the great yearly occasion of gaiety and thanksgiving.

Gateway to the Bordeaux swimming pool.

Inside the cathedral at Saint-Emilion.

Dining room, Hôtel du Chapon Fin, Bordeaux.

processing plant. This is a fully automatic bottling factory having a daily output of 75,000 bottles of fruit juice.*

The visit in the afternoon to the Oenological Station and the Municipal Laboratory, with its remarkable exhibition of laboratory equipment, was a demonstration of the extent of the scientific control exercised.

A visit to the Grand Theatre, kindly arranged by the Municipality and *Syndicat d'Initiative*, concluded a full day.

**Arcachon Oyster Beds**

Black Friday arrived too soon. The end was approaching. A breath of sea air on our visit to the Arcachon oyster beds was welcome. The oysters are bred on tiles laid down in such a way that they can be raised, the oysters scraped off, and the process repeated.

In the evening the Group gave a farewell dinner to its French hosts. Dr. Hughes proposed the toast of the French Republic in a brilliant speech. The toast of The King was proposed by M. le Général Chaban-Delmas, *Maire de Bordeaux, Député de la Gironde*. The toast "Our Guests from the Gironde" was proposed by Drs. Hughes and Nicholls and responded to by M. le Général Chabon-Delmas. "*La Société de Chimie Industrielle*" was proposed by Dr. J. G. Davis and acknowledged by M. M. Deschiens. Dr. Amos proposed the toast to the ladies, which was acknowledged by Mrs. Dyson, who was complimented on her delightful speech.

And so one more successful tour ended.

Those taking part were:

Dr. and Mrs. A. J. Amos, Mr. and Mrs. A. L. Bacharach, Mr. R. C. Baker, Mr. L. H. G. Barton, Mr. and Mrs. F. K. Birkett, Mr. J. P. Bowley, Miss E. A. M. Bradford, Mr. and Mrs. S. W. Butterworth, Mr. W. G. Carey, Mr. E. Chilman, Dr. and Mrs. H. E. Cox, Dr. and Mrs. J. G. Davis, Dr. and Mrs. G. M. Dyson, Mr. and Mrs. T. H. Fairbrother, Mr. and Mrs. A. N. Harrow, Mr. W. L. Hill, Dr. and Mrs. E. B. Hughes, Mr. and Mrs. F. G. Kent, Mr. E. M. Learmonth, Mr. and Mrs. H. B. Marston, Mr. R. D. Mason, Mr. and Mrs. T. McLachlan, Mr. and Mrs. G. McLaren, Mr. and Mrs. H. Mears, Mr. and Mrs. H. C. Moir, Mr. and Mrs. R. H. Morgan, Dr. J. R. Nicholls, Mr. W. C. O'Neill, Mr. R. O. Samuel, Mrs. S. M. Tritton, Dr. A. J. V. Underwood, Mr. C. E. Wiseman, and Dr. C. G. de Worms.

French participants were:

MM. J. Balmadier, R. Bienaime, Boucaut, C. Bourgery, M. et Mde. M. Deschiens, P. Ducommun, Gaignaire, J. Gerard, L. Herlin, Jorand, C. Lagneau, Laugery, E. Mayolle, and Mlle. J. Moiroud.

* A description of this factory was published in FOOD MANUFACTURE, April, p. 163, 1949.

# Plan for Increasing Home Beef Production

DESPITE the improvement in agricultural technique, the world output of food per acre was rising comparatively little, with a consequent fall in the numbers of livestock and the output of meat, milk, and eggs, said Mr. Thomas Shaw in a paper outlining a plan for increasing home production read to the British Society of Animal Production.

A general survey of the world suppliers does not present an encouraging picture. Canada and America are both well below their peak war-time export figures of beef, Australia is below her pre-war volume of exports, although she is gradually regaining her figures. South American countries continue to be well below their own pre-war figures. A check on the details of exportable surplus available for importing countries shows that they are 15 per cent. less than pre-war figures.

Mr. Shaw said that war-time controls encouraged weight at the expense of quality. Farmers were encouraged to produce big "rangy" types of cattle and the public paid for bone instead of meat. This process has to be reversed entirely, and the recently announced price arrangements begin a welcome move in this direction. If the home farmer is to fill the gap in our present supply position, he must reckon with the fact that the only beef that stands a chance of competing with imported beef, grade for grade, is that of equal or better quality. Breed, management, and feeding are all concerned in this matter of quality. It is feared that the expansion of the dairy industry in Great Britain will prove inimical to the development of a beef industry producing a high quality product, but Mr. Shaw declared that he did not believe that this need necessarily be so, and quoted the De la Warr Report to show that the dairy cow population had increased from 2,000,000 in 1920 to 3,000,000 today.

There can be no doubt that home-produced beef can, if shorn of unnecessary production costs incurred by antiquated equipment or slipshod management of labour and suchlike, not only fill the gap between consumption and production, but will reduce overseas expenditure and prove a more equal competitor to foreign products. In this respect the home producer must have the closest linkage between himself and the consumer. The producer who has some relation with sales machinery, whose production, processing, and marketing are integrated, is not only more efficient, but he is more progressive and adventurous.

# Freezing Concentration of Fruit Juices

In a paper presented by J. F. Kefford, M.Sc., A.A.C.I., of the Commonwealth of Australia C.S.I.R., to the Australian Institute of Refrigeration, a summary is given of the information on the concentration of fruit juices by freezing which he collated during a visit to Great Britain, Germany, and America. Up to date two methods have been employed in Australia, one by the addition of sulphur dioxide or benzoic acid, and the other by pasteurisation and storage in sealed containers.

CONCENTRATION of fruit juices is commonly achieved by removing water as water vapour in a vacuum evaporator. It is also possible, however, to remove water from fruit juices in the form of ice. When a juice is progressively cooled, pure ice begins to separate, and the liquid phase therefore becomes concentrated in dissolved substances. This process continues until saturation of the liquid phase is reached at the eutectic temperature, when, instead of pure ice, a mixture of ice and dissolved substances separates. In fruit juices, the dissolved substances are mainly sugars, with lesser amounts of organic acids and a variety of minor constituents.

### Advantages of Freezing Concentration

Advantages of concentration by freezing over concentration by evaporation are:

(*a*) There is no loss of the volatile flavouring materials and no damage to the heat-sensitive constituents in fruit juices.

(*b*) At the low temperature (below 10° F.) used there is no danger of spoilage during the time required for concentration.

(*c*) The energy required to freeze water (80 calories per g.) is only one-seventh of that required to evaporate water (560 calories per g.).

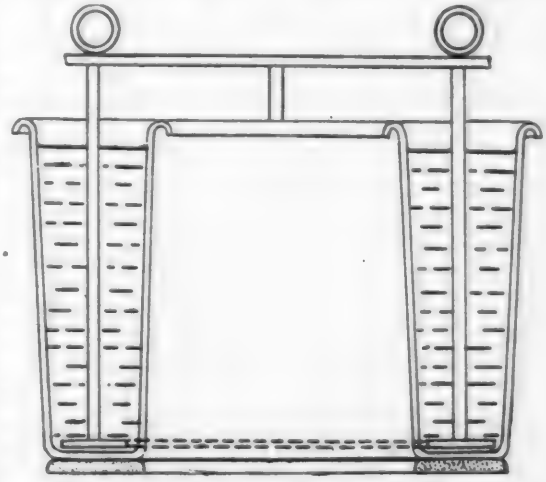
The last advantage is largely a theoretical one, since in practice it has been more than offset by higher equipment and handling costs in freezing concentration. A major technical obstacle has been the separation of the ice from the concentrated liquid phase, an operation which is less difficult if the rate and extent of ice formation are controlled so as to produce large ice crystals of suitable shape and orientation.

### Design of Equipment

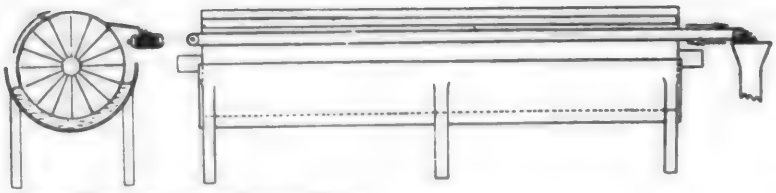
Engineers from many parts of the world have investigated these problems, the first equipment to receive commercial acceptance being designed by Dr. G. A. Krause, in collaboration with the manufacturers of Linde refrigeration machinery. Krause relied on centrifuging to separate ice from concentrate, but he prepared the frozen material in a special vessel similar in shape to the centrifugal basket. This annular vessel was filled with fruit juice, the frame was inserted, and the vessel lowered into a brine tank at about 14° F. Freezing commenced, and the ice crystallised in the form of needles to the cooling surfaces. When freezing had proceeded far enough, *i.e.* for about two hours, the vessel was transferred to a bath of water, where the block of frozen juice was loosened and lifted out by means of the frame. The block was placed in the basket of a lagged centrifuge of the same dimensions and spun for fifteen minutes. Further recovery was effected by washing the ice once with original juice and once with ice water melted from a previous batch. As these wash liquids increased in solids content they were added to later batches for concentration. The overall losses in the ice fraction were of the order of 1 per cent. of the original juice.

### Best Working Conditions

The best working conditions were those in which approximately half the water in the juice was removed as ice in one freezing operation. Thus, commencing with a juice having a typical soluble solids content of 10 per cent. to 12 per cent., one freezing treatment gave a concentrate containing 20



Krause-Linde annular freezing vessel.



**Krause-Linde continuous freezing drum.**

per cent. to 30 per cent. solids. A second freezing at a lower temperature raised the solids content to 40 per cent. to 50 per cent., and a third freezing at a still lower temperature increased the solids content further, but not beyond about 60 per cent.

In third-stage freezing of higher concentrates, better results have been claimed by freezing at two temperature levels—one, for instance, at 4° F. and then at −15° F., rather than at the single level of −15° F. Improved yields and recoveries and higher solids contents were obtained because the ice separated in large well-formed crystals.

However, a further development in which both the freezing of the product and the separation of the ice from the concentrate are carried out continuously instead of batchwise has superseded this process

### Continuous Process

Continuous separation of the concentrate from the ice is achieved in a heavy-duty horizontal screw press in which a solid stainless steel screw moves within a cylindrical screen having fine openings in the form of pinholes or slits. The speed of the screw can be regulated between 7 and 21 r.p.m., and it is claimed that the pressure developed is in the region of 4,000 p.s.i. The concentrate drains through the screen, and the ice is discharged at the end of the screw.

Two principles govern the separation process in the screw press:

(*a*) The ice crystals become plastic under pressure and grow together so that the concentrate liquid phase is displaced from the interstices.

(*b*) Heat developed from the mechanical work of pressing thaws some of the ice and the water so formed washes out residual concentrate.

By means of these mechanisms it is possible to obtain a high recovery of solids in the concentrate, and in practice only about 1 per cent. of the solids is discarded in the ice. Use is made of the ice to provide cold water, which precools the original product in a plate-type heat exchanger to 35° F. to 40° F.

### Processing Orange Juice

In America much interest has been evinced in freezing concentration in connexion with the concentration of orange juice, where at least one commercial plant is using the process, but with much simpler equipment than the Krause-Linde machines.

In one Florida plant orange juice is extracted and screened, then precooled to 35° F. to 40° F. in an insulated tank with internal refrigerating coils and finally filled into aluminium "ice-cans" each holding 15 gallons. These cans are lowered into a brine tank at 20° F., and the orange juice freezes slowly over about twenty hours.

Next day the cans are lifted from the tank and the frozen juice mass is removed and crushed. In this crusher the ice mass falls between two drums which are studded with pieces of ¾ in. stainless steel rods with mitred ends, and which rotate at high speed in opposite directions.

Ice from the crusher is fed into one or other of two basket centrifuges used alternately. Each centrifuge has a 42 in. perforated stainless steel basket which takes a charge of 30 gallons of crushed ice. During filling, the centrifuges are run at slow speed to distribute the load evenly, and then, when full, at high speed for one and a half minutes.

The liquid phase leaving the centrifuges is an orange juice concentrate having a soluble solids content of about 34 per cent. The residual ice, which constitutes about 70 per cent. of the weight of a batch, contains about 4 per cent. solids. The ice is not washed, and it is not considered to be profitable to allow it to melt and to take off a second liquid fraction. The efficiency of this plant from the point of view of recovery of solids is not high; only about 75 per cent. of the original solids are recovered in the concentrate.

If the solids content of the concentrate is greater than 34 per cent., fresh juice is added to reduce it to this level, and, in any case, to each batch some pulp, screened from the original juice, is added back to restore a natural appearance. The product is then filled into 6 oz. cans, sealed, frozen in a room at −10° F., and held at this temperature until shipped by road trucks cooled with dry ice.

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## BOOKS RECEIVED

*Orders for any of the books listed below or reviewed in this issue may be placed with the Books Department,* FOOD MANUFACTURE, *17, Stratford Place, London, W.1. It is regretted that under present conditions it is not always possible to supply books by return of post.*

*Citrus Products.* By J. B. S. Braverman. Pp. 424+xiv. Interscience Publishers, London and New York. Price £2 14s.

*World Fisheries Yearbook, 1949.* Pp. 456. British-Continental Trade Press, London. Price £1.

# Scientific Information Services

SIR ALFRED EGERTON, M.A., F.R.S.
*Professor of Chemical Technology, Imperial College of Science*

## Part II

In the second part of this paper are discussed the distribution of scientific literature to the user-scientist and methods by which such a service could be improved.

PASSING now to questions related more particularly to the distribution of scientific literature to the user-scientist, the scientist's needs are:

A. 1. To be kept abreast of the work that is going on in his own field, or in fields which may border on his work.
2. To have opportunity of being kept informed of what is going on in other fields.

B. 1. To be able with the least possible effort to collect information on any particular subject and to have it available for study.
2. To be able to refer quickly to any work that has been done in the past.

How can these needs be met in the most convenient way?

It emerged from the Conference that the key to furnishing the scientist's needs lay in the improvement of library and documentation services; no other changes in system would have so great an effect. The two needs under heading B specified above are related to abstracting services, and here again it is not a question of creating anything new but of improving what already exists.

### Outline of the Information Service

In the organisation that makes it possible for the scientist to find his way about the great mass of scientific literature and find information on a narrow topic three services are necessary:

(i) Libraries and services to store and supply documents.

(ii) Guides and arrangements to help in finding specific items.

(iii) Human agency to select and evaluate and direct information where it is needed.

It is the combination of these three which is implied when the information service is considered.

On the one side there are the books, the journals, the reports and reviews. Then there are the two main sections: the Library, with its system of classification and codifying, and the Abstracting Organisation with its system of classification and index; the two sections being closely interrelated in action but not necessarily in location. There is the Human Agency, the librarians and the information officers, and within the system the many scientists who are reviewing, preparing abstracts and guides, and collating information of many different kinds. The coding and classification of information is mainly a library function: the coding process can be partly automatic, but the construction of the code is not; nor can critical evaluation be a mechanical process, though the finding of related information may become partly so; the scientific or technical information officer can give special assistance in these constructive and critical functions.

### Methods of Using Scientific Literature

In preparation for the Scientific Information Conference various field studies, along with questionnaires, had been made, and the results were studied statistically. One of these related to the reading habits of the individual scientist; another to obtaining facts about abstracts; and a third, which had been carried out earlier, analysed the way in which scientists used the Science Library, South Kensington. Dr. Urquhart said at the Conference: "If this Conference is to succeed where other conferences on similar subjects have failed, it must collect facts, analyse facts, and act on facts—and ignore opinions." There is quite a lot of fact-finding yet to do, and the Information Services Committee is planning for further research into the uses of scientific information.

Professor Bernal gave an account of the research which had been made for the Conference, and summarised the results as follows:

> "The most important of these results was that emphasising the large reliance which research workers place on libraries, principally departmental libraries. Three-quarters of their reading is derived from this source, only a relatively small proportion of reading is done in journals subscribed to by the research workers themselves. It would appear that the average research worker skims some nine Papers a week and reads three carefully. He makes notes and usually keeps a card index. In 37 per cent. of the cases the Paper was read as a result of a reference in another Paper, and only in 18 per cent. on account of an abstract. Separates provided only 6 per cent. of the general reading, but 12 per cent. of the careful reading. Significant differences were found in the reading habits of various types of scientist; those in the applied fields read, on the whole, fewer Papers than their more academic fellow workers. Senior workers looked through more Papers, but read fewer carefully, than junior workers. The number of Papers

read in various journals was significant; 2,000 Papers carefully studied during the period of the enquiry were read in 430 different journals, but the distribution among journals varied enormously—one-quarter of the Papers were found in 6 journals, half in thirty, and the last quarter in 330 different journals. This substantiates a law derived by Bradford from studies of the actual distribution in journals of Papers covering particular topics and shows that his conclusions apply equally strongly to Papers actually read. It is also notable that more foreign than British Papers were read and that the great majority of these was American. The major conclusion that can be drawn from these results is that, in the absence of any rational system of distribution of Papers by subject, the libraries are the essential agents in the distribution of scientific publications."

**Assistance in making Use of Scientific Literature**

Returning now to make a few comments on the four main needs of the research scientist which were formulated. Twenty-five years ago it was a comparatively simple task to assimilate what had been done in (say) combustion chemistry, and there was no difficulty in keeping in touch with all that was being published from the few laboratories which specialised. Now the position is quite different. Not only has the subject become of greater importance in relation to chemistry as a whole, but its application in technology—for instance, to engines of various kinds—has greatly extended; so the research chemist finds himself overwhelmed by reports and publications which should be read critically to keep fully abreast of the whole subject. This state of affairs seems to be the same in many live branches of science. There are two courses open: either little notice must be taken of what is going on and concentration given to developing a solitary line of one's own, or the help of others must be sought, preferably including a trained scientific information assistant in a small departmental library, who can intelligently sift the literature and cut short the process of collation, assimilation, and association, bringing only selected material forward for critical study. Surely it is the more important for the scientist to have time to think about his work than to be spending a high proportion of it absorbing the thoughts of others which are useful only in so far as they activate his own work. Original work only is referred to here; the conclusion would not, however, be very different for those who need to have information for imparting to others or for administration; it is often that the same person is performing all three functions! No precise guidance can be given, everyone is free to use the literature as he thinks best; all that can be said is that in order to deal with the flood, additional mops are needed.

**Abstracts and the Need for Collaboration**

How is one to find and keep in touch with all the work, quite apart from how to deal with it having received it? Most scientists belong to a society which fosters the science in his particular field, and most societies provide him with the publications which enable him to keep in touch. The enquiry made during the Conference about how scientists actually use scientific literature showed that they did not read the journals of the societies to which they belong so much as other journals, but this does not mean that the societies are not giving them what they want, for they do in general make possible the provision of abstracts relating to their particular field, and from these they can find any Paper that may interest them.

The "abstracts"—referring here to the abstract journal, not to the particular abstracts—must: (i) cover the particular scientist's subject and borderline subjects completely; on the other hand (ii) they must not be so voluminous or numerous that they cannot be scanned quickly; (iii) they must indicate sufficiently well what is in the Paper so as to tell him whether it would be worth his while to study it, and (iv) they must be as up to date as possible. Abstracts at present fall short of these requirements because: (i) there are gaps in some; (ii) unnecessary overlap in others; (iii) they are not suitably prepared to please every scientist, and (iv) there is too much delay between the publication of a Paper and the appearance of the abstract.

**Conflict between Abstract Requirements**

Abstracts have to serve a number of different purposes, and this has led to difficulties. First of all (*a*) there are the main abstract journals which have to comb all the publications within a certain field and abstract everything which is worth recording so that reference can be made to it. They perform the dual purpose of providing permanent records of scientific literature and of giving current awareness of publication. A certain degree of overlap is necessary so that scientists need consult only a minimum number of abstract journals.

Secondly (*b*) there are the needs of those who are working in special fields to be supplied. They need to have gathered together for them all the up-to-date current information in different fields which is likely to interest them. There is a certain conflict between the requirements (*a*) and (*b*), but with good collaboration it can be avoided. If the time factor involved in the preparation of abstracts is also carefully attended to, it was felt that the effort of preparing both types of abstract could be reduced. The provision of authors' synopses is likely to help in reducing the delay in preparing abstracts. Without collaboration there may arise a further tendency to multiplication of effort in certain directions to the detriment of the general improvement, for that tendency has already provided an unnecessary duplication of effort; there are two main journals of chemical abstracts in the English language.* Another difficulty is that for

* Quite recently collaboration has been arranged between the American and British Chemical Abstracts which may obviate much of this duplication.

some purposes only a short abstract is needed indicating as precisely as possible what is to be found in the original Paper, whereas for other purposes a longer abstract is required, particularly for those who cannot easily obtain the Paper itself.

Each abstract journal has to have a clear set of principles and rules within which its abstracts are prepared and which are known to the user.

One of the recommendations of the Conference was that a Standing Consultative Committee for Abstracting Services should be constituted, which would be composed of representatives from bodies publishing abstracts and have the object of promoting co-operation. Various items for consideration by the Committee were then specified. This Committee is now taking shape, and it has already made some effective proposals.

**Single Copies of Original Papers**

From the references got from abstracts, it is now possible to find almost any publication in some library or other. A difficulty arises here. There is not always time to go to a big library with the hope of finding almost anything; besides, it may be necessary to have the Paper at hand to study carefully. It is therefore essential to be able to get a copy of the Paper. In many cases it is convenient to have the copy of the actual Paper and to keep it; but it takes time to get off-prints from the publisher or author, and authors do not always have a sufficient stock to give away. No general but only a supplementary supply, which can well be improved, can be got in this way. The scheme which Professor Bernal put forward at the Conference was designed to obviate these difficulties, but it would have introduced many others, and the Conference did not commend it. The real answer to the problem is in the libraries: (i) by extension of facilities for books and periodicals on temporary loan; (ii) by extension of copying facilities so that photostat or other copies of information can be obtained, and (iii) for supplying outlying places at great distance a microfilming service is also a necessary supplement. This extension of these library services is one which they are prepared to provide and one which would be a great service to science. It has involved careful consideration of the question of copyright. It was quite clear at the Conference that unless librarians knew how they stood in relation to copyright, they could not provide the service essential for the scientist.

**Library Facilities**

The Scientific Information Services Committee has gone into this matter and has drafted a Declaration which has been accepted by the Council of the Royal Society. Societies and publishers can be invited by libraries in the sense that " they will regard it as fair dealing for the purpose of private study or research when a non-profit-making organisation such as a library, archives office, museum or information service, owning or handling scientific or technical periodicals published by them, makes or delivers a single reproduction of a part of an issue thereof to a person representing in writing that he desires such reproduction in lieu of loan . . . and that he undertakes not to sell or reproduce for publication the copies supplied . . . under certain provisos." The Declaration does not cover copies made from books, non-periodic or non-serial publications.

In America facilities have been provided by the chief libraries for some time under a special agreement, and the Committee considers that the step that is now being taken over here will extend in a most useful way, within the law, the services which libraries can give to the scientist.

If there is fear that copies of Papers made in this way might reduce sales of journals, quite apart from this being in most cases unlikely, it should be borne in mind that the societies, in giving their services towards publication, are conferring a public benefit which has almost necessarily to be publicly supported, and the whole information service is interrelated and has to be made as efficient as possible.

**Meeting the Needs of the Scientist for Information**

To what extent now are the scientist's four needs satisfied? We will suppose that he has a good departmental library which receives the main abstract journals and periodicals in his field of work and some of the chief general scientific periodicals and reviews. He must also have at hand the data tables and chief reference books relevant to his subject. We will assume that he can apply to a central scientific and technical *lending* library for any other periodicals required, or that he can go to a scientific and technical *reference* library to refer to any other books, periodicals, or reviews that he cannot get in his departmental library or even to browse among its shelves. We shall suppose that in his departmental library there are facilities for collecting in card-index form any references required for future consultation. This can very conveniently be done by a photocopying process (such as the Retocee) direct from the abstract. We shall suppose also that there is an information officer to help him in using these services, eliminating much of the unessential. The last of the needs, viz. the finding and collection of references to past works, is done, of course, with the aid of abstracts, and for this purpose good indexing and classification of the abstracts are essential. In large libraries which provide a bibliographical service, it is possible that such searches could be made on demand, and they might even use sorting machines of various kinds.

With the information services available as outlined above, the research scientist in an academic, industrial, or government laboratory would be " in clover," and should not become overwhelmed by the volume of literature however great it may be-

come. But take away the private card index, the information assistant, and the means of getting copies of Papers, and he is either not going to be able to make full use of the information available or will waste a lot of time in trying to get it.

### Needs of the Isolated Scientist

The situation which has been examined refers to a research worker in a great centre where there are plenty of library facilities, but what about the scientist at some outstation, say, in Africa? His needs are different. Information takes far longer to reach him; abstracts are therefore more than ever out of date, he has no central library within reach, he may have only a very limited stock of journals, and his work may range over a wider field than the specialist at home. Means of getting copies of the original Papers, informative abstracts, and rapid notification of published papers seem to be the main needs. Increase in the facilities for photostat and microfilm copying not only in Europe and America but in the main Colonial libraries, would again greatly assist towards meeting his needs, particularly if it included microfilming and photostating for quicker distribution of abstracts. The development of "sweep up" articles on particular subjects, reviews, and a science news service would also be of special advantage to him.

### Summary

(i) There should be more research into how information is used and how it can be best classified.

(ii) The abstracting services could be bettered by closer collaboration with a view to improving the coverage and classification; to hastening the issue of abstracts and to supporting, on the one hand, the main scientific abstract journals, and to assisting, on the other hand, the subsidiary abstracting organisations which exist to serve a special *clientèle*.

(iii) The establishment of facilities in libraries for issue of photostat copies of papers, a declaration regarding copyright having been provided.

(iv) The strengthening and co-ordinating of the whole library system and provision of bureaux of documentation in connexion with the central libraries.

(v) The extension of the use of scientific and technical information officers.

(vi) Provision of adequate funds to maintain a high standard of scientific publication of abstract journals and library and documentation services.

**TO AUTHORS**

**FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.**

## Wines and Spirits

IN spite of the interest shown by many in the consumption of alcoholic beverages, there are few good books dealing with their production and analysis in the English language. It is therefore interesting to note the publication of a comprehensive work* on the subject, although it is written essentially from the American standpoint. As might be expected from a volume of which Dr. Jacobs is joint author, the most satisfactory portion is the second half, dealing with analysis and American law.

The official methods of analysis of the Association of Official Agricultural Chemists are given in full, and United States definitions of whiskies, brandies, other liqueurs, and wines are discussed.

Unfortunately, some of the regulations given in the book have been made obsolete by the new rulings recently published by the Bureau of Internal Revenue, which come into force on October 1, 1949. These concern declarations on the label as to age and type to differentiate U.S. whiskey from the genuine imported article. Other rulings concern the specification of place of origin of imported liquors; where American producers offer a "Scotch type" it must be made as a blend of grain whiskey instead of neutral spirits as allowed heretofore.

It is rather difficult to follow the tables showing the composition of individual fruit juices and the fruit wines made from them until it is realised that fruit may be produced from the juice of the sound, ripe fruit with or without the addition, after fermentation, of pure condensed fruit must, or that the original fruit juice may be ameliorated before, during, or after fermentation, by dry sugar or by sugar and water in such proportion that the volume is not increased by more than 35 per cent.

It is to be regretted that European journals have largely ceased to publish series of individual results of analyses, so that figures from European sources are all many years old. One cannot but wonder how far tables taken from Konig's *Chemie der menschlichen Nahrungs- und Genussmittel* (1904) or from Schidrowitz's evidence before the "Royal Commission on Whiskey and Other Spirits" (1909) are representative of modern products. The authors have therefore been obliged to cull all recent figures from American sources and, as mentioned above, American methods of manufacture are not necessarily the same as those employed on this side of the Atlantic.

The section of the book dealing with the chemistry and technology of the production of wines and liquors is somewhat superficial, but it will be useful as a general summary of modern methods. It is not, however, a cookery book for the manufacture of any individual product, and cannot be treated as such.—T. McL.

* *Chemistry and Technology of Wines and Liquors.* By K. M. Herstein and M. B. Jacobs. 2nd Edition. Pp. xii+436. Van Nostrand Company, U.S.A. Price 30s.

Seaweed is collected from the shore and transported by lorry to the drying centre.

# Alginates for the Food Industry

SPECIALLY CONTRIBUTED

The important part played by alginate products in the food and allied industries makes the present work of the Scottish Seaweed Research Association of particular interest. On the successful outcome of their efforts will depend the extent to which the already considerable industry can be developed to achieve the establishment of a major and permanent one with an estimated annual turnover value of £15 million—the figure visualised by the Scottish Council (Development and Industry) and the officials closely concerned with this particular work.

THE existing industry is already an important factor in the commercial and industrial field, providing invaluable raw materials to the food, pharmaceutical, ice cream, cosmetic, medicinal, surgical, dental, and textile industries.

There are a relatively limited number of firms working in this field, but already they have done much to establish and also expand the uses and potential uses of alginate products. One of the pioneer and leading firms in the field—Alginate Industries, Ltd.—offers an outstanding instance of persistent and successful development; their activities, related to those of the Scottish Seaweed Research Association and other firms in the field, give an indication not only of their own achievements to date but the considerable scope which remains.

In co-operation with leading chemical firms in the United Kingdom and abroad, alginates have been established as basic industrial colloids, whose use depends upon the capacity to form viscous solutions, gels, films, and filaments. In the food industries suitable forms are used to thicken and stabilise milk puddings, table desserts, sauces, soups, and gravies. As a stabiliser in synthetic creams, fillings, and for general bakery uses, the various prepared types have proved of major importance. For salad creams, mayonnaise, and processed cheese the alginate extracts offer excellent properties of emulsification and stabilisation. They are used for gel forming of fruit jellies, confectionery, canned meats, meat pies, and many other products.

Not the least interesting example of a practical application is the marketing of "Chellies"—a transparent gel in the form of *glacé* cherries, offering obvious economies and an alternative product of first-grade quality.

Policy throughout has been to co-operate with users for whom specialised forms of alginate pro-

**Seaweed is dried in the sun for three months, kiln-dried in the factory for twelve to forty hours, and finally ground to a powder.**

existing incomes by working each year on the harvesting of weed. Whether a major industry can be established on a permanent basis, using continuous labour rather than the periodic or limited labour now in use, is the problem which the Association is attempting to solve.

### Progress since 1944

The research—launched in 1944 and now well organised—has proved beyond doubt that the deposits of littoral and sublittoral weed are fully equal to the maintenance of a permanent industry on a major scale. The crux of the initiation of such an industry is the economic harvesting of the weed. No positive opinion can yet be offered on this point, but it is claimed that some progress is being made towards that end.

ducts are prepared, but several well-known products, including "Manucol" for the food and pharmaceutical industries and "Alinade," an ice cream stabiliser, have been marketed.

Weed factories are being operated at Kames Bay in Argyll, Orosay, North Boisdale, and, through an associate, an Irish station at Kilkieran, Carna, Co. Galway. Processing is carried on at Girvan, in Ayrshire, and at Barcaldine, by Connel, in Argyll.

### Preparation of the Weed

The crofter collects the selected weed and carries through preparatory air drying before selling to the processing company. The weed, in stalks about 4 ft. in length, is then thoroughly dried by hot air blast and ground by hammer mill technique into a coarse powder. In this form the product is stable for something like two years, thereby permitting a reserve to be built up to maintain continuous working.

The graded, examined, and approved weed is treated with alkaline liquors to give the crude extract containing the alginates. This extract is purified and converted to alginic acid from which is derived the various alginate salts.

The present activities of the Scottish Seaweed Research Association link up with these efforts to convert seaweed to useful and profitable purposes. It is evident that crofters can usefully add to their

What is already certain is that no one method can be used in every instance, and it is regarded as likely that ultimate success will lie in the use of varying methods of partial or full mechanisation, according to the circumstance involved. Sub-littoral weed is the more abundant type and the more difficult to harvest, and it is on this type that current research work is being carried out. Two experimental mechanised units are in action, the first having completed trials and provided valuable fundamental data.

### Mechanising Weed Collection

An early attempt at mechanisation was to cut the weed, draw it to the surface craft, and discharge it into the hold where it could be retained while the surplus water was returned to the sea. For this purpose a sledge-type unit was designed with two rotating discs to cut the weed, after which it was drawn through suction pipes to the boat above. The difficulties involved here include the familiar experience encountered with fibrous materials, when the strands of raw material ultimately entwine the cutters and stop their action.

Rather more success has been achieved with two types of grapnel on which the Division is now working and from which it is hoped a permanent method may be evolved. These are discontinuous and continuous grapnel operations. The latter method is of particular interest to the handling

engineer since it approximates most closely to the standard practice of factory operation, although it must again be emphasised that the conditions are quite different and prevent anything like factory flow.

The discontinuous system involves the use of two special grapnels mounted on twin davits operated by a winch on a specially adapted vessel. The grapnels are played alternatively, one up one down, slung overboard on either beam. By this method, which could be usefully employed by smaller crofters interested in the work, some 20 tons of weed might be collected in one day.

The continuous grapnel system is a development of this system incorporating the conveyor belt system in co-operation with a series of specially designed hooks or grapnels. A prototype equipment operating on this principle is being fitted to an ex-lifeboat which will be towed by a 30 h.p. 30 ft. motor vessel on its trials.

The rear end of the conveyor is carried over the sea bed on supporting wheels, while the sixteen special hooks travel around the metal framework over which the designers have used a covering of wire mesh. The hooks are arranged to travel faster than the motive unit and are designed to prevent anchoring. The net depresses the weed, and the hooks gather it and convey it to the surface where it is delivered into the hold.

**Economic Aspects of the Industry**

The continuous grapnel system is regarded as offering the fullest prospects of successful economic harvesting of seaweed and will be investigated fully. The prize—an industry worth £15 million per annum—is too attractive to ignore, and this or some alternative system must be achieved to permit Scottish competition for the world trade which seaweed offers. Competing industries are in Japan, Ireland, Norway, and the U.S.A.; in the last named, weed harvesting is simplified by the fact that the species of weed on the Pacific coast of America float on the surface. In Scotland the greatest growth is a species of sub-littoral seaweed, demanding different methods of harvesting as they are heavier than water.

Elsewhere labour costs may be such as to permit a greater use of manual labour on littoral seaweed growths. Even in Scotland it is possible at present for crofters to spend a certain part of each year on seaweed collection and to add a substantial amount of income to their total annual earnings. What is now being sought is some form of supplementary harvesting method, on a much larger scale, mechanised to the maximum limit permissible under the conditions imposed, to ensure that the very important British industry already growing up is fed with a continuous and adequate supply of cheap raw material.

# Ministry of Food

## Latest Statutory Instruments

**The list given below is the continuation of the list of Orders published in *Food Manufacture*, July 1, 1949, page 312.**

| *No.* | *Date.* 1949. | |
|---|---|---|
| | | PRICE FIXATION |
| 971 | May 22. | Order amending the Cheese (Control and Maximum Prices) Order, 1948. Revokes S.I. 1949, No. 127. |
| 1028 | „ 27. | Order amending the Condensed Milk (Control and Maximum Prices) Order, 1943. Revokes S.R. & O. 1947, No. 2777. |
| 1040 | June 19. | Order amending the Syrup and Treacle (Maximum Prices) Order, 1941. Revokes S.R. & O. 1947, No. 724. |
| 1110 | „ 18. | Order revoking the Canned Puddings (Maximum Prices) Order, 1945. Revokes S.R. & O. 1945, No. 1408; 1946, No. 1528; 1947, Nos. 1195 and 1764; and S.I. 1948, No. 538. |
| | | FEEDINGSTUFFS |
| 1067 | June 10. | The Feedingstuffs (Manufacture) Order, 1949. Revokes S.I. 1948, Nos. 1099 and 2388. |
| | | FRUIT |
| 1012 | June 1. | Order amending the Pears Order, 1948. |
| | | POINTS RATIONING |
| 951 | May 22. | The Food (Points Rationing) Order, 1949. |
| | | PRESERVES |
| 1111 | June 19. | Order amending the Preserves Order, 1947. |
| | | RATIONING |
| 526 | Apr. 1. | The Scotch Whisky (Auction Sales) Order, 1949. Revokes S.R. & O. 1942, No. 1271 and 1943, No. 80. |
| 880 | May 8. | Order amending the Fats, Cheese and Tea (Rationing) Order, 1948. |
| 952 | „ 22. | The Meat (Rationing) Order, 1949. |
| 953 | „ 22. | The Sugar (Rationing) Order, 1949. |
| 954 | „ 22. | The Bacon (Rationing) Order, 1949. |
| | | SACCHARIN |
| 945 | May 21. | The Saccharin Order, 1949. Revokes S.R. & O., 1944, No. 69. |
| | | SOAP |
| 973 | May 22. | The Soap (Licensing of Manufacturers and Rationing) Order, 1949. Revokes S.I. 1948, Nos. 1638 and 2808. |

## Amino Acid Requirements

QUANTITATIVE requirements of amino acids in the human diet were described by William C. Rose at a meeting of the American Society of Nutrition held in Detroit last April. Dr. Rose stated that histidine and argenine were not required in a sufficient and balanced diet. In his investigations healthy male students were fed on a mixture of pure amino acids flavoured with lemon juice and sugar. This was supplemented with wafers made of corn starch, sucrose, centrifuged butterfat, corn oil, and vitamins. By means of this controlled diet the source of all nitrogen was accurately known. In addition to the eight essential amino acids, glycine and urea were fed, when necessary to keep the nitrogen intake up to the desired amounts for use in body synthesis of non-essential amino acids.

Dr. Rose set forth what he called "recommended daily intake" levels. These levels were: L-tryptophan, 0·5 g.; L-phenylalanine, 2·2 g.; L-lysine, 1·6 g.; L-threonine, 1·0 g.; L-valine 1·4 g.; L-leucine, 1·4 g.; and methionine, 2·2 g.

The Osborne-Mendel Award, established in honour of the two "Fathers of Nutritional Science," was presented to Dr. Rose for his contribution to the understanding of nutrition, particularly through this most recently reported work.

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## CORRESPONDENCE

### Will Whales become Extinct?

TO THE EDITOR OF FOOD MANUFACTURE

DEAR SIR,—In your issue dated June 1, on page 242, you publish a note under the heading "Will Whales become Extinct?" In this note you quote the unnamed writer of a recent article who asks a number of questions on the future of the whaling industry.

As you comment, the writer in question does not attempt to reply to the queries he has raised. His questions assume, however, the accuracy of a number of facts which he gives, some of them only partly correct, and most of them some years out of date.

For more than ten years—since the International Whaling Agreement signed in London in 1937 limited the length of the whaling season in 1937-38—there has been no "tendency to catch as many whales and to produce as much oil as is necessary and profitable." The experience of at least one of the British expeditions in the season just ended is quite contrary to the writer's assertion "the size of whales caught is tending to diminish." The average length of whales caught by this expedition during the season 1948-49 was 78·8 feet for blue whales and 67·8 feet for fin whales, compared with 77·9 feet for blue whales and 67·3 feet for fin whales during 1947-48.

The question of competition does not arise at present because the world shortage of domestic fats is likely to maintain the demand for whale oil for some years at least.

The overall maximum limit of 16,000 blue whale units (approximately 25,000 whales) fixed for recent seasons by the International Whaling Convention after careful consideration by the representatives of fifteen nations is constantly under review.

Last season eighteen floating factories operated in the Antarctic with 211 catcher ships, compared with thirty-four factories and 281 catchers in 1938-39.

The only effect of "more efficient ships and bigger fleets" will be to shorten still further the period in which the 25,000 whales are caught. The highest catches in the Antarctic (which constitutes 90 per cent. of the world's catch) were 40,201 in the season 1930-31 and 46,039 in the season 1937-38. The present limit indicates that international control is already more successful than the writer of your questions is aware.

Yours faithfully,

BERNARD VINSON,
*for The Whale Meat Advisory Bureau.*

*London.*

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## Spices and Spice Substitutes

A STUDY of the physical attributes of spices and spice substitutes was presented at a recent meeting of the Division of Agricultural and Food Chemistry of the American Chemical Society by R. A. Nanz, C. A. Tyler, and L. C. Cartwright.

Natural spices, including capsicums, caraway, cassia, cloves, coriander, ginger, mace, mustard, nutmeg, paprika, pepper, and sage, were studied in terms of their physical attributes. Their flavour, colour, and other characteristics were compared with those of spice substitutes, spice oils, and oleoresins. The moisture content of natural spices falls within a definite range for each. Bacterial counts were interestingly low in certain spices.

Using a reliable and accurate panel technique, evaluations of taste, odour, and colour were made on natural spices in comparison with spice oils, oleoresins, and powdered spice substitutes both by themselves and in suitable test foods. For comparison of natural spices with the salt- and sugar-based spice substitutes, the natural spices were mixed with salt and sugar in comparable concentrations of flavour. The test food bases included a plain white sauce, a sugar syrup, and an oil white sauce, each to represent a particular type of food.

In general, spice oils and other substitutes were lower than natural spices in terms of organoleptic evaluations.

# The Hydrogenation of Oils

F. H. SLADE, A.M.I.Mech.E.

## Part II

The various systems of hydrogenation in practice employ one or more methods in order to ensure an adequate contact of gas, liquid, and solid. These systems and the plant they involve, together with the pre-treatment of crude oil and post-refining, are dealt with in the concluding part of this series.

As the presence of impurities, such as organic sulphur compounds, fatty acids, albuminous matter, etc., has a toxic effect on the catalyst and so interferes with hydrogenation, it is essential that the crude oil is refined prior to the hardening process. This can be effected by either neutralising with caustic soda to form a soap material of a density different from the oil and so facilitate separation of impurities or by distilling the free acids with steam to effect neutralisation and removal.

A diagrammatic layout of a typical plant for the former method is shown in Fig. 5. In this the crude oil is pumped to the neutraliser and treated at the proper temperature with the correct quantity of caustic soda required by the particular oil being refined.

The oil and caustic soda solution is thoroughly mixed by an agitator fitted in the neutraliser, which is suitably proportioned for one batch per twenty-four hours to allow ample settling time and to ensure minimum refining losses, so that at the end of the mixing period the treated charge is permitted to settle and a clean separation is obtained, with the "soap-stock" or "foots" settling out at the bottom.

The bright neutral oil is drawn off through a swinging suction line to the washing vessel, wherein it is first washed with a brine solution and then warm water to remove all traces of soap dissolved in the oil, while the foots left in the neutraliser are run into a foots-tank, after separating further traces of neutral oil, and passed to storage, or to a soap plant, or for treatment with mineral oil to convert it to acid oil.

The neutral oil is pumped to the bleacher, in which it is vacuum dried by means of a steam ejector and in conjunction with a barometric condenser producing the necessary vacuum in the vessel, after which it is heated to the bleaching temperature, treated with fuller's earth and a small quantity of activated carbon, and finally pumped through a filter press to the bleached oil storage tank as clean oil ready for further treatment.

### Hydrogenation Methods

A variety of considerations enters into the design of hydrogenation plant, but an adequate contact of gas, liquid, and solid is of primary importance,

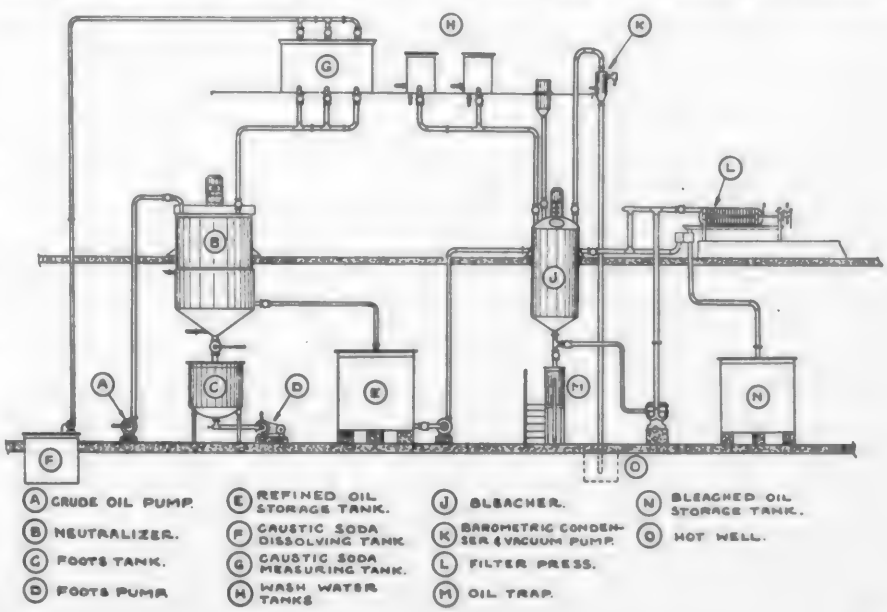


**Fig. 5. As organic sulphur compounds, albuminous matter, etc., have a toxic effect on the catalyst and so interfere with hydrogenation, it is essential that the crude oil is refined prior to the hardening process. This can be effected by either neutralising with caustic soda to form a soap material of a density different from the oil and so facilitate separation of impurities. The neutral oil is then bleached.**

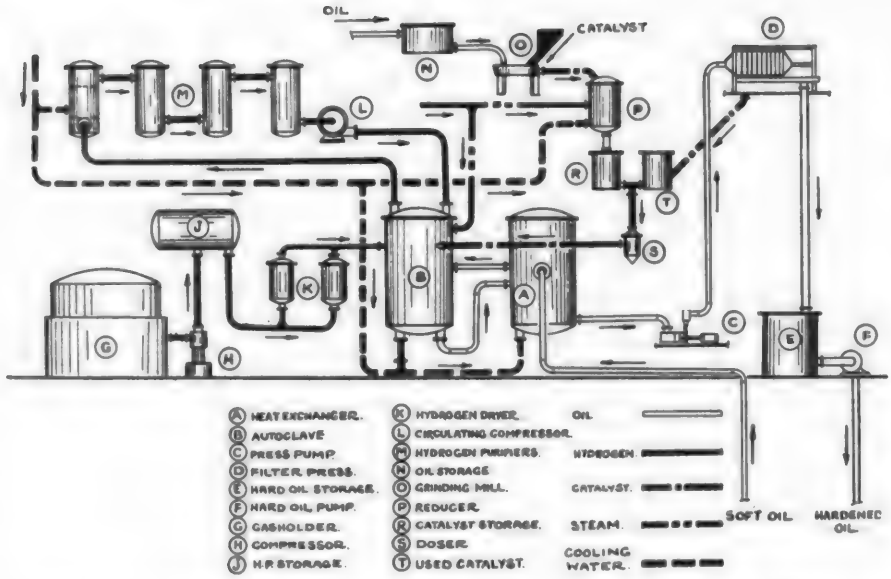


**Fig. 6. In the hydrogenation plant the oil is heated to the appropriate initial temperature, the prepared catalyst is added, and hydrogen is then passed through the autoclave. The temperature of the mixture is raised to that securing the best results from a standpoint of colour, rate of hardening, and gas consumption. Cooling is carried out and the purification of the circulating hydrogen takes place in a purifying battery.**

and the various systems in practice employ one or more of the following methods:

1. The agitation of the oil by mechanical means, such as a paddle or turbo-agitator, to produce an intimate mixing of catalyst, oil, and hydrogen.
2. The circulation of hydrogen by means of a compressor, which allows a very fine dispersion of the gas in the catalyst-oil mixture.
3. The circulation of the catalyst-oil mixture with a pump by withdrawing the mixture from the bottom of the converter and spraying it into the top.
4. The continuous process, in which a stationary catalyst is employed and the oil passes over it in counter-current to hydrogen.

### Absorption of Hydrogen

An essential feature of these processing methods is that the amount of hydrogen absorbed by the oil through catalytic reaction is controllable, as the quantity used depends upon the oil being treated and the degree to which it is to be hardened.

This absorption is linked with the iodine value, consequently as hydrogenation causes hydrogen to combine with the unsaturated glycerides, the extent of unsaturation of the hydrogenated oil is less than that of the original oil, dependent upon the degree to which hydrogenation has taken place, and the iodine value is reduced accordingly.

Actually the amount of hydrogen absorbed is directly proportional to the difference in the iodine value of the original oil and that of the hardened product, while each unit reduction in iodine value theoretically requires nearly 34 cubic feet of hydrogen per ton of oil. In practice, the amount of hydrogen needed varies from 105 per cent. to 120 per cent. of the theoretical, depending upon the purity of the hydrogen and the quality of the oil.

### Catalyst Preparation

Before considering the hydrogenation plant proper, it is to be stressed that, in addition to the desirability of hydrogen and oil of a high degree of purity, the methods used for producing the nickel catalyst are extremely important, as it should be very active, highly selective, possess a minimum susceptibility to poisons, and be of a high uniformity in order to facilitate standardisation of operation control during the hydrogenation operation.

Catalytic nickel prepared by "wet" reduction of nickel formate meets these requirements, is produced at lower cost, and requires little supervision and technical control during its preparation.

The nickel formate undergoes a thermal decomposition at temperatures ranging from 170° C. to 240° C., and a complete reaction is achieved by maintaining the maximum temperature of 240° C. for approximately one hour, while 0·05 per cent. to 0·1 per cent. of nickel of the weight of the oil is required for the hydrogenation process, the actual quantity being determined by the kind of oil used and its pre-treatment.

### Hydrogenation Plant

As already indicated, the various plants employ one or more of four methods of hydrogenation. Briefly reviewing a few of these, it is found that the P.G. hydrogenation plant proper consists in the main of a catalyst reducer, mixing tank, filter press, and converter.

During regular operation the filter press removes

the catalyst from the oil after hydrogenation, which, after a small quantity is discarded, is immediately transferred to the mixing tank and mixed with a little refined oil to stop it solidifying.

A small amount of freshly prepared nickel catalyst (generally less than one-tenth of 1 per cent. of the weight of the oil to be hardened) is added to the recovered filter cake and oil, and this mixture is pumped from the catalyst mixer to the converter, where the balance of the oil charge is added.

**The Converter**

The converter is evacuated to remove air and moisture, and the oil charge is maintained in continuous circulation, being heated simultaneously to the operational temperature, at which stage hydrogen is admitted and the gas pressure allowed to build up.

After the hardening operation is complete, the temperature of the charge is reduced to a stage where it can be pumped through the filter press while still warm for removal of the nickel catalyst, which, as already stated, is returned to the mixer for use again with the next charge.

Complete mixing of the oil, catalyst, and gas is obtained by means of a vertical spindle agitator, while the converter is also fitted with coils for steam-heating or water-cooling the charge. It should be observed that as hydrogenation reaction is exothermic, careful attention is paid to the control of temperature for the initiation of the conversion and also to subsequent operation temperatures, in the former case a temperature of 130° C. to 140° C. being sufficient, with an operating temperature of between 175° C. and 195° C. for vegetable oils.

The hardening process period varies between thirty minutes and eight hours, depending upon the amount of oil and the activity of the catalyst, while the size of the converter is dependent upon the size of plant, for between three and five charges can be treated every twenty-four hours.

**Flow of Operations**

Reference to the flow sheet reproduced in Fig. 6 will show the process operations carried out in the Bamag hydrogenation plant. The oil is heated to the appropriate initial temperature, the prepared catalyst is added, and hydrogen is then passed through the autoclave.

The temperature of the mixture is raised to that securing the best results from a standpoint of colour, rate of hardening, and gas consumption, and as gas absorption proceeds samples are taken to determine hardening progress—either by means of a refractive index, melting-point, and/or iodine value.

During this process the rate of gas absorption decreases as the oil becomes more saturated, and after the desired melting point has been reached the hydrogen current is shut off and the temperature reduced by closing the heating coil.

Cooling takes place either in the hardening autoclave itself or in a special cooling apparatus, which is so designed as to preheat simultaneously the oil to be hardened in the following batch. Preheating in this manner raises the temperature of the incoming oil as high as 115° C. and effects a fuel saving of approximately 10 to 12 lb. per ton of hard fat produced.

Purification of the circulating hydrogen takes place in a purifying battery consisting of a cooler, degreaser, deodoriser, and scrubber, and separation of the catalyst from the hardened oil is carried out in a steam-heated filter press. The removed catalyst, with the addition of a small quantity of new catalyst, is used over again in subsequent batches of oil until it is no longer sufficiently active to harden a batch in the normal hardening period.

**High-speed Hydrogenation**

The hydrogenation unit, shown diagrammatically in Fig. 7, is of different and novel type. It is of particular interest in that it makes use of a powerful pump to secure intensive mixing. Hydrogenation takes place inside the pump.

Oil, with catalyst and hydrogen, are fed simultaneously into the pump, being used here as an effective oil dispersion device and not as a means of transport. Due to the intensive contact of the three phases, the reaction proceeds at a much faster rate inside the pump than is encountered with any processes employing any of the four mixing methods.

To give an example of this, a cottonseed oil was

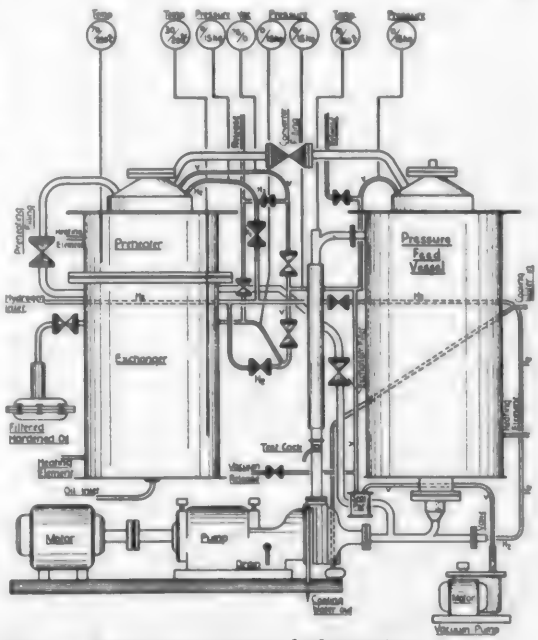


**Fig. 7. Bamag-Saroc express hydrogenator.**

hardened in fifteen minutes to a melting point of 37° C., while a highly unsaturated fish oil, which generally is difficult to hydrogenate to saturation, was hardened without difficulty to a melting point of 63° C. (Iodine Value = 1) in sixty minutes.

The heart of the unit is the pump, which is of the centrifugal type, has a large capacity, and operates against a low pressure head. The other main parts of the unit are the heat exchanger, pre-heated oil receiver, pump feed vessel, and the separator.

The soft oil enters first into the heat exchanger, where its temperature is raised by means of the out-going hardened oil, and passes into the oil receiver, from where it flows into the pump feed vessel.

Suitably prepared catalyst is added to the oil in this vessel, or is mixed into the oil at an earlier stage, after which the oil and catalyst flow from the bottom of the feed vessel to the pump.

Hydrogen enters the pump in two ways—one by direct injection of fresh hydrogen, the other by means of a special suction pipe, which ensures that any surplus gas which collects in the top of the feed vessel is recycled.

By this simple arrangement a simultaneous feed of oil, catalyst, and gas into the pump is assured, where the reaction takes place at an exceedingly fast rate, owing to the intensive mixing action of the pump. It will be noted that it is not necessary to circulate the hydrogen, and that the small amount of gas which reaches the top of the feed vessels is merely entrained there in the fast stream of oil.

When the reaction is completed, the hardened oil passes to the heat exchanger, where most of its heat is given up to the fresh charge, and the oil is then filtered to remove the suspended catalyst for re-use.

**Post-refining Operations**

Post-refining is a term applied to the collective operation of neutralising, washing, drying, and bleaching, as practised upon the hardened or hydrogenated oil, and is carried out to produce a high-quality finished product that will not become rancid in a hot, humid atmosphere.

The process is effected in the same manner as for crude oil, but as the hardened fat has only to be freed from residual fatty acids or solid material, the amount of caustic soda, bleaching earth, and activated carbon, etc., required will be much less than for refining the crude oil.

A final important process is that of deodorising to eliminate objectionable odours and flavours, caused by volatile constituents, which can be removed by steam distillation.

Temperature and pressure have a direct bearing on the success of the process, especially the latter, as steam at elevated temperature will tend to split the neutral glycerides into their component fatty acids and glycerol, which readily distills off.

As this splitting tendency of the steam bears a direct relation to total pressure, it is essential that the pressure is kept low if a minimum of fatty acids is desired in the finished product; otherwise the rate at which hydrolysis occurs may nearly approach the rate at which the fatty acids are removed by distillation at the end of the deodorisation period.

In this process the hardened oil is pumped to a closed cylindrical vessel, wherein the charge is heated to a temperature of between 180° C. and 220° C. depending upon the oil, superheated steam is blown in for a period varying between four and six hours, and the vessel is maintained under high vacuum. The oil, after deodorising, is cooled under vacuum to an appropriate temperature before being pumped to storage *vid* a filter press.

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# Bacteriology in the Cannery

We had the pleasure in 1943 of reviewing the first edition of Mr. J. G. Baumgartner's book on the microbiology of canned foods and also the second edition in 1946. A reference to these reviews will reveal the high opinion which we gained from a careful study of the book, and the publication of the third edition* bears witness to its acceptance by the canning industry.

In the new edition, a chapter on the sources and control of microbial contamination has been added. The subject is considered under the headings: raw materials, plant, containers, and cooling water. Most of the material used in this chapter is new to the book, although some of the data appeared in various sections of the previous edition.

The section dealing with the effects of heat on micro-organisms has been revised and extended, and now forms a separate chapter. As was said in our review of the first edition, there is not an unnecessary sentence in this short book, but the canning bacteriologist will be able to find practically everything there which would enable him to approach any bacteriological problem that might crop up in the factory. The list of references will enable him to put his hand on any aspect of the subject which he might need to study in greater detail.

* *Canned Foods: An Introduction to their Micro-Biology*. By J. G. Baumgartner. Pp. 278+x. Churchill, London. Price 15s. net.

# Horticultural Research at Cheshunt

**Some fifty members of the Agriculture Group of the Society of Chemical Industry, and their friends, attended the Summer Outing at the Experimental and Research Station at Cheshunt, Herts., on June 11, when they inspected the work being carried out in the glass-houses and the laboratories.**

THE early part of the afternoon was taken up by visits to the different houses, in which are being grown cucumbers, melons, tomatoes, carnations, chrysanthemums, and mushrooms.

In the cucumber house experiments are being continued to compare the relative values of composted straw and horse manure in the preparation of the beds. Crop yields from the horse manure and straw mixtures have been found to be approximately equal. Work on the red spider pest has led to the conclusion that a breed resistant to azobenzene is capable of development, and the use of this insecticide has been abandoned in favour of an oil emulsion spray.

In the melon house similar experiments with horse manure and straw compost have demonstrated the superiority of the former.

In the carnation house there are four experimental beds, one with brick base, one with a raised bench as used in America, one with a tiled base, and one of soil. It has been found that the yield of flowers was the greatest in the plants grown in the American raised bench, and the least in those grown on the soil. In this house are also being carried out experiments on hydroponics. Different materials for holding the nutrient solution have been investigated, and some very satisfactory results obtained by the warming of the material by electrical resistance wires covered with plastic.

In the tomato houses various experiments are being carried out, one being to determine the effect of omitting lime and phosphate from the fertiliser treatment over a period of years. To date, no harmful effects have been recorded, but investigations are being continued. In another house the use of alginates and milled seaweed to replace horse manure is being investigated, and in others studies are being carried out on leaf mould disease.

Work in the mushroom shed is based on American principles, the beds being arranged in shelves. The nature of the best casing soil and the use of synthetic composts are being investigated.

In the laboratory devoted to the study of insecticides and fungicides, Mr. W. H. Read demonstrated, among other things, the effects of insecticides on the glasshouse red spider mite, and explained the methods of investigation into the efficacy of fumigation with emulsion sprays and by other means.

**Messrs. J. N. Davies, G. Winsor, Drs. O. Owen, W. F. Bewley (Director), Mr. W. H. Read, and Miss E. Grossbard of the Cheshunt Station.**

Miss E. Grossbard, in the antibiotics laboratory, described investigations on the control of plant diseases by microbial antagonism. The attempt is being made to induce the production of an antibiotic substance in the soil by the use of *P. patulum* and *A. clavatus* grown on autoclaved wheat straw and glucose. Tests with other media have shown that sugar beet waste is a satisfactory medium for the production of an antibiotic substance by *P. patulum* which inhibits the growth of soil organisms pathogenic to the tomato.

Other organisms known to produce antibiotic substances are being tested against *B. mycoides* and *B. phytophthorum*.

In the absence of Dr. Howles, Miss Grossbard explained the work being carried out in the virus disease laboratory. Investigations include those on the sources of virus infection in glasshouse plants.

In the chemistry laboratory, Dr. O. Owen described work on the nitrification of organic nitrogenous fertilisers, alginates as sources of organic

carbon in propagating mixtures, the effects of acute mineral deficiencies, and magnesium deficiency in *Solanum capsicastrum*. Other workers in this laboratory are Messrs. G. W. Winsor, J. N. Davies, and J. H. L. Messing.

Another laboratory inspected is concerned with the investigation by Mr. P. H. Williams and Miss M. Ebben of plant diseases, especially *Didymella* stem rot of tomato, and tomato root rot, and in still another department the pests of the carnation plant are being studied by Mr. E. R. Speyer and Mr. W. J. Parr.

Mr. A. G. Pollard, chairman of the Agriculture Group, expressed the thanks of the members to the director, Dr. W. F. Bewley, and the staff of the Station for the privilege of seeing the work carried out. Dr. W. F. Bewley, welcoming the members, spoke of the years prior to 1946, when the Station was engaged in the dual task of research and advisory work. It was in that year that the National Agricultural Advisory Service was inaugurated, which enabled the Station staff to devote themselves exclusively to research, with increased rate of progress.

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## Bakers in Embryo

An important move has been made in Glasgow to link the technical and administrative functions in the baking industry and to ensure that future production executives will be competent to hold any administrative appointment. Practice in this industry, as in many others in the past, has tended to regard "the office" and "the works" as two distinct entities. The effect of this system has been the refusal of acceptance of expert technical managers to top executive rank because of an admitted lack of experience of commercial administrative work.

This state of affairs is changing, as industries appreciate that training for management can ensure a place for technical or "works" men in the higher executive. The present move in the baking industry in Scotland is one further example of this trend.

Changes in productive methods have resulted in the creation of large factory units, and there is every indication that this trend will persist. Production management in such units is a function demanding not only first-rate baking training and experience, but a sound knowledge of the principles of commercial administration. To meet this need, the Royal Technical College, Glasgow, has added a new course on bakery management to the existing excellent work done by the College in its Scottish School of Bakery. The specific purpose of this new course is to train students for executive posts as bakery managers or production managers with a wider field of interests than those involved in the normal training course.

The course will be for a four-year period. In each year the student must spend three months in a bakery. Entrants will be required to present a certificate of University standard or its equivalent, thus ensuring that they are equal to the level of training and competent to handle the type of post visualised. On successful completion of the course, the student receives a Bakery Manager's Diploma in Bakery Science in the form of an Associateship of the Royal Technical College—a recognition which should ultimately lead to a progressive appointment and responsibilities of the type involved in top management duties.

An important step in this programme has been an arrangement whereby bakeries in the area are taking accepted students as apprentices. This ensures that these students—limited in number to the facilities available at the College and to the number of suitable appointments likely to be available over a considered period—are given remuneration during their College training and facilities for practical work. It must not be assumed, on the other hand, that completion of this course will automatically qualify a student for executive rank. He will rather have to demonstrate his capacity to apply in hard practice the training given him in both the bakery and administrative spheres.

Among the subjects included in this course—and not normally included in a bakery school training curriculum—are a knowledge of engineering and chemistry, industrial administration, fuel efficiency research, and allied subjects. Each of these subjects is an extension of the existing training and particularly in industrial administration. In this subject are a whole range of subdivisions, each essential if the future bakery manager is to reach executive rank prepared and fit to handle his job. The increasing importance of the accountant in industry and the paramount use of costing systems demand that the student be made familiar with the most modern methods of costing as these apply to his own field of responsibility. Only if and when the student has some knowledge of this aspect and an appreciation of the interrelationship of cost and successful production can he safely be entrusted with top management duties.

The expanding field of welfare and industrial law, of Trade Union relationship, the functions of the many Committees and Boards responsible for the government of industry—and likely to be retained permanently in some form or other—demand a knowledge of Trade Union organisation and responsibility, again as it affects the executive as opposite number. There are similar responsibilities involved in an appreciation of commercial and industrial law—subjects not normally included in technical training curriculum. Emphasis is not, however, on administration rather than on baking. Students will be bakers with a sound basic knowledge of management rather than administrative men with some knowledge of baking.

# A Fermentology Classic

One of the earliest accounts of the fermentation industry appeared in 1886 when Alfred Jørgensen handled the subject in a masterful manner and produced what is now a classic textbook. It ran to many editions and was printed in several languages. A new edition,* revised by Albert Hansen, has recently been published, and although it has been brought up to date, the general layout still follows closely the earlier editions of Jørgensen. It is intended as a teaching book and also as a work of reference for those engaged in practical work in the fermentation and food industries, dairying, and similar technological fields.

The chapters are virtually identical with those of the 1939 6th English edition, and cover the history of fermentology, laboratory equipment, general characteristics of fermentative organisms, media, sterilisation and disinfection, technique, moulds, yeasts and bacteria, with an appendix on media, stains, and reagents. All chapters have been expanded, especially that on bacteria.

Although the book claims to cover a wide field, it is famed chiefly for the matter dealing with yeasts and with moulds and bacteria of importance in brewing.

Essentially a practical book, it might well be described as the scientific brewer's *vade mecum*; probably no other single book contains so much useful information.

The academic biochemist and bacteriologist may find the scientific parts of the book a little bit dated, but this is of no serious consequence for the practical man; indeed, it is often dangerous to include very recent scientific theories in a book for practical technologists. The descriptive matter dealing with the culture and handling of yeasts and other micro-organisms is excellent, and the 139 plates at the end of the book are a most valuable feature.

**Industry and Science**

The reviewer's chief criticism of the book is that it tends to fall between two stools. Broadly speaking there are two types of technological book. One attempts to deal with a science and the other with an industry. Jørgensen's book in its present form attempts both. It would perhaps have been better if the author had confined himself to the microbiology of beer and related materials—surely a large enough subject for any book. This part is so well done and so frequently betrays the master hand in the writing that some references to other subjects appear unsatisfactory in comparison. It is suggested, therefore, that future editions might omit those dealing with butter, cheese, soil, tobacco, etc., and any available space used for further detailed matter on beer technology or modern contributions to biochemistry and microbiology in relation to the brewing industry.

The work quite understandably has a Danish background, but the rather mixed use of classifications might be confusing to the microbiologist not familiar with Orla-Jensen's system. It would have been advantageous to have included the names used in Bergey's "Manual" as synonyms, and a table summarising the Bergey classification would have been very useful. The treatment of micro-organisms outside the brewing industry tends to be restricted. For example, the ability of coliform bacteria to grow at 44° C. is a property rather lightly dismissed, whereas in water and public health bacteriology it is one of the most important tests used.

There are a few uncorrected typographical errors and the translation savours of the original Danish, a trifling fault which could have been avoided if the author had asked an English friend to read the manuscript. References to standard textbooks are not always to the latest edition.

However, these are minor blemishes in a classical work which will doubtless continue to be regarded as the standard one for both practical and scientific workers in the brewing industry. As a source of information about yeasts in the brewing industry it is probably unsurpassed.—J. G. D.

* *Micro-organisms and Fermentation.* By the late Alfred Jørgensen, rewritten by Albert Hansen, 1948. Pp. 550+xxxvii plates. Griffin and Co., London. Price 60s. net.

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# Dried Pineapple

The dried pineapple which has reached this country is a product of South Africa, and it is understood that approximately 100 tons were imported in 1948. The material is costly at the present time, having been retailed at 7s., but importers in this country seem to be enthusiastic. It is suggested that in present circumstances there would be a market for much larger quantities than are immediately available and it appears that new sources of supply would be welcome provided a quality equal to the present South African product can be offered. The opinion has been expressed that dried pineapple would sell as a dried fruit in normal times in competition with dried apricots. However, dried apricots are sold in the U.K. at 1s. a lb. at present, thus in the long term a lower price for dried pineapple relative to the price of dried apricots than that now ruling seems to be indicated.

Moreover, were canned pineapples plentiful and reasonable in price this product would be likely to affect the sale of the dried material to some extent. Nevertheless, dried pineapple appears to be a new product in which commercial interest should be maintained. The Ministry of Food does not control imports but importers require licences.

# News from the Industry

## FORTHCOMING EVENTS

### Milk Processing Courses

A course of study for the examinations of the City and Guilds of London Institute in Milk Processing and Control will be resumed on Monday, September 26, at Chelsea Polytechnic. This Final Course, Section B, Chemical and Microbiological Control of Milk Processing, will extend until Easter, and the syllabus of the final examination in this subject will be covered in two sessions' attendance of two evenings per week as follows:

Microbiological Control: Monday, 6.30-8.30 p.m.
Chemical Control: Friday, 6.30-8.30 p.m.

Intending students should attend the Polytechnic for enrolment and payment of fees on Wednesday, September 21, at 6 p.m., or preferably signify their intention to do so by post on or before that date, in which case fees should be paid on the first evening of attendance. Should the number of employees from any one firm desiring to attend courses be sufficient, it would be advantageous if applications for admission could be forwarded *en bloc* by the firm.

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### Food Group Conference

A conference on "Amino Acids and Protein Hydrolysates," to be held in the William Beveridge Hall, University of London, Senate House, London, W.C.1, is being arranged by the Food Group of the Society of Chemical Industry. During the conference, which will commence on the evening of September 28 and continue throughout the two following days, papers will be presented upon the chemistry, properties, preparation, analysis, industrial applications, and nutritive aspects of amino acids and protein hydrolysates, and it is hoped that visits may be arranged to laboratories engaged upon work in this field. The following outlines the programme:

*Evening of Wednesday, September* 28.

Opening Address by Professor E. C. Dodds, F.R.S.
*Chairman:* Dr. L. H. Lampitt.

*Morning of Thursday, September* 29.

Amino Acid Composition of Proteins. Dr. K. Bailey.
Properties of Proteins. Dr. A. Neuberger.
Analytical Methods other than Chromatographic and Biological. Dr. G. R. Tristram.
*Chairman:* Mr. E. B. Anderson.

*Afternoon of Thursday September,* 29.

Visits to laboratories and demonstrations of work with proteins and amino acids.

*Evening of Thursday, September* 29.

Microbiological Methods of Analysis. Dr. E. C. Barton-Wright.
Chromatographic Analysis. Dr. R. L. M. Synge.
The Role of Amino Acids in the Deterioration of Food. Dr. C. H. Lea.
*Chairman:* Dr. E. B. Hughes.

*Morning of Friday, September* 30.

The Manufacture of Amino Acids. Dr. C. R. Ockrent. Mr. R. O. Atkinson. Dr. C. Simons.
Displacement Chromatography as a Preparative Method for Amino Acids. Dr. S. M. Partridge.
*Chairman:* Dr. H. E. Cox.

*Afternoon of Friday, September* 30.

The Manufacture of Protein Hydrolysates. Dr. G. M. Dyson. Mr. E. M. Bavin.
Industrial Application of Amino Acids and Protein Hydrolysates in the Food Industry. Dr. H. G. Rees.
*Chairman:* Dr. J. R. Nicholls.

*Evening of Friday, September* 30.

Amino Acids and Protein Hydrolysates in Human and Animal Nutrition. Dr. D. P. Cuthbertson, F.R.S.E.
*Chairman:* Mr. A. L. Bacharach.

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### Engineering and Marine Exhibition

"Production efficiency is the road to national recovery" will be the theme of the 17th Engineering and Marine Exhibition which is to be held at Olympia from August 25 to September 10. A wide range of engineering products will be exhibited and a complete section will be devoted to internal combustion engines for industrial and marine use, including a display of Diesel engines. Many of the exhibits will have transparent sections fitted so that the operation of the internal mechanism can be studied under working conditions. Demonstrations will be given of industrial X-ray apparatus and equipment, and in the field of industrial safety devices there will be an exhibit of smoke-detection equipment which gives early warning of an outbreak of fire.

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### Bakery School Courses

As from September next, students entering the National Bakery School will have a choice of two courses of study, one lasting two years and leading to the National Bakery Diploma, the other lasting three years and leading to the Higher National Bakery Diploma. The standard of craftsmanship reached in the two courses will be the same, but those doing the three-year course will have the craft instruction spread out over the three years, leaving more time for special courses in science and commerce. The course is therefore suitable for those who have already reached Matriculation standard in chemistry and physics and who wish to study the scientific aspects of the trade.

All students who wish to be admitted to either the National or Higher National Diploma courses which begin on Monday, September 19, should write at once to the National School of Bakery, Borough Polytechnic, Borough Road, London, S.E.1.

The part-time classes (leading to City and Guilds Certificates) begin at the National Bakery School on Monday, September 26. Students wishing to register for these should go to the Borough Polytechnic on Monday, Tuesday, or Wednesday, September 19, 20, and 21. No registrations can be made prior to these dates.

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### Food Factory at Poole

A 60,000 sq. ft. factory at St. Clement's Newtown, Poole, Dorset, has been acquired by the Ryvita Co. Production is to commence in the near future, and many local people will be engaged.

### New Board Elected

The board of Bamag Limited, has recently been strengthened with the purpose of widening the activities of the company. The chairman of the new board is the Rt. Hon. Lord Brocket and the other new members are Mr. Eoin C. Medie, Mr. Alfred W. Newbery, and Dr. M. Steinschlaeger.

Mr. B. Bregman and Mr. T. E. J. Hillman, who have been associated with the company for many years, remain on the Board.

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### Industrial Maidstone

Production of paper, one of the industries for which Maidstone is famous, was well represented in the industrial section of an exhibition held recently during the town's fourth centenary charter celebrations week.

On one part of the stand devoted to the industry, the process of making paper by hand was carried out, while diagrams and pictures showed the modern mechanical processes in the making of kraft and other paper. Corrugated cases for protecting bottles in transit, cartons showing the various colour printing that can be used, and coloured corrugated paper for display purposes were exhibited by Medway Corrugated Paper Co., while an associated company, Medway Paper Sacks, displayed their multi-wall sacks in which cement is packed and sent all over the world.

A paper testing laboratory, attended by technical assistants who explained their work to visitors, was operated on this stand.

At the distributive trades section, two stands were occupied by Roneo, who exhibited a range of their duplicating and office printing methods, visible records, their new "U" series desks, and other office equipment.

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### Carton Manufacturers' Open Day

Parents, friends, and relatives of the employees, and others interested in the possibilities in carton manufacturing toured the Birmingham works of Boxfoldia when they held their third "Open Day" recently.

# Vegetable Adhesives Association

## RELAXATION OF CONTROL DESIRED

The ninth annual general meeting of the Association of Manufacturers of Vegetable Adhesives was held recently at the Connaught Rooms. The meeting was preceded by a luncheon at which Mr. L. D. Coombe, President of the Association, took the chair; Sir Leonard Browett, director of the National Union of Manufacturers, and Mr. W. Leonard Hill, chairman of Leonard Hill, Ltd., were present as guests of the Association.

In proposing the toast of the guests, Mr. Coombe referred to the work that Sir Leonard was doing for the manufacturers of this country, and said he was confident that he would continue to give his valued assistance and guidance in matters affecting adhesive manufacturers. Mr. Coombe considered there should be some relaxation of the control on their raw materials and also that some action should be taken to overcome the Government surcharge which they were at present having to pay and which was hampering their export trade to a considerable extent. These two important points, Mr. Coombe thought, were matters on which Sir Leonard would be able to give assistance, and he had every intention of approaching him.

Mr. Coombe then spoke of his pleasure in welcoming Mr. Leonard Hill as their other guest. He knew of Mr. Hill's interest in their industry, and felt sure that he would, through his various publications, let the public know of the existence of the Adhesives Association.

In replying to the toast, Sir Leonard Browett paid a tribute to the work which their President was doing, and had done for so many years, for the adhesive industry. He referred to the importance of the adhesive industry and the hold-up in the production and distribution of a very wide range of commodities which would follow any stoppage in the supplies of vegetable adhesives.

Mr. Leonard Hill then delivered a witty speech in which he referred to the various definitions and uses of vegetable adhesives. He recognised the importance of the vegetable adhesive industry and of the part which adhesives played in a large number of other industries.

The luncheon was followed by the annual general meeting at which the following officers were elected:

*President:* Mr. L. D. Coombe (Gloy and Empire Adhesives, Ltd.).

*Vice-President:* Mr. C. J. Burton (Fixol and Stickphast, Ltd.).

*Other members of the Council:* Mr. C. A. Smith (H. A. Smith, Ltd.); Mr. W. A. Lee (Sichel Adhesives, Ltd.); Mr. A. R. G. Williams (National Adhesives, Ltd.); Mr. J. W. Nash (Duché and Knight, Ltd.).

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### Change of Address

The address of the Office of Wages Boards and Councils is now: Ebury Bridge House, Ebury Bridge Road, London, S.W.1. (Telephone: Sloane 9661.)

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### Fabrics for the Food Industry

Specialists in all types of industrial cotton yarns, cord fabrics for tyres, belting ducks, canvas, and other fabrics used in the rubber, electrical, chemical, and surgical trades, as well as in the manufacture of foods, John Bright and Brothers carry on the business of cotton spinners, doublers, manufacturers, and finishers at their group of mills in Lancashire. They also undertake the doubling and weaving of large quantities of rayon yarns for these purposes. Their belting duck section is one of the largest in the country and has played an important part in supplying the rubber trade with the essential fabric for the manufacture of conveyor belts.

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### Change of Telephone Number

The telephone number of the A.P.V. Company head office at Wandsworth Park is now: Vandyke 4492-9. The telegraphic address has been altered to: Anaclastic, Wesphone, London.

# Solid Fibreboard Cases

## PRESENT-DAY DIFFICULTIES OF THE INDUSTRY

Many commodities are still marketed in a wide variety of shapes, styles, and units per case, which could, with a little more thought, be packed in a standard form with a resultant saving in cost and without losing any sales appeal, and much remained to be done in the field of standardisation, said Mr. Hugh Stevenson, speaking on the subject of "Solid Fibreboard Cases" at a recent meeting of the Institute of Packaging.

He devoted the greater part of his lecture to a description of the manufacture and use of solid fibreboard containers and made some interesting comments on some of the difficulties which confronted the industry today. Referring to the paper control restrictions of furnishes for each grade of board, the speaker maintained that the restriction was not only unnecessary but positively detrimental to the manufacturer of really good cases.

He was glad to be able to report that progress was being made in the field of adhesives for lamination. The introduction of synthetic resins into starch gave reasonable hope that the disadvantage of a hygroscopic layer would shortly be overcome. His firm had made some commercial test runs using starch with resins and this had shown a slight improvement in dry burst and rigidity. The increase in wet burst was of the order of 400 per cent. and the decrease in moisture pick-up over 30 per cent. to 100 per cent., depending on the amount of resin incorporated.

On the question of usage of solid fibreboard, Mr. Stevenson said that 90 per cent. of non-brittle consumer goods could be packed into either a corrugated case or a solid fibreboard case and travel quite satisfactorily. There was, however, a field peculiar to the solid fibreboard case—firstly in the packaging of goods having a very high specific gravity, and secondly for particularly arduous service. In this respect he drew attention to the American V.1 and V.2 solid case specifications used in wartime.

There were several reasons why special specification cases for particularly arduous conditions were not being produced. Unfortunately the industry still laboured under the quota system, and any major alteration in proportion to materials used might mean running out of the material and having to shut down before the period ended. In any case, experience to date led one to believe that enormously superior specifications were unnecessary.

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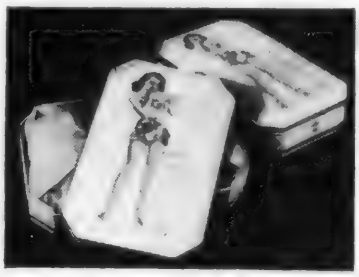
### A Rival for "Jane"

An entirely new type of pocket-sized full colour tin featuring Carol, a delectable red-head, who has been specially created for Horners by an internationally famous artist, is destined for the export confectionery markets. The full colour reproduction is of a very high standard, and the detachable lid is holed and corded for use as a new type of pin-up.



The outstanding nature of these tins, which are printed by the Metal Box Co., is expected to create a new buying-urge among those who remained unmoved by the usual type of fancy tin, and follow-up tins are in hand. The Carol tins are packed with "Boy Blue" assortment of toffees or "Dainty Dinah" mixed fruit drops.

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### National Research Development Corporation

In accordance with the National Research Development Corporation Regulations, 1949, the President of the Board of Trade has appointed the following as members of the Corporation (which has been set up with effect from June 28, 1949):

Sir Percy Mills, K.B.E. (Chairman).
The Rt. Hon. the Earl of Halsbury, F.R.I.C., F.Inst.P. (Managing Director).
Professor P. M. S. Blackett, F.R.S., M.A.
Sir John McLean Duncanson.
Sir Edward H. Hodgson, K.B.E., C.B.
Mr. W. E. P. Johnson, A.F.C., C.P.A., A.F.R.Ae.S.
Sir Edward de Stein.

The functions of the Corporation are defined in the Development of Inventions Act, 1948 (under which the Corporation has been set up) as follows:

(*a*) of securing, where the public interest so requires, the development or exploitation of inventions resulting from public research, and of any other invention which the Corporation considers is not being developed or exploited or sufficiently developed or exploited;

(*b*) of acquiring, holding, disposing of, and granting rights (whether gratuitously or for consideration) in connexion with inventions resulting from public research and, where the public interest so requires, in connexion with inventions resulting from other sources.

According to the Act, the expression "invention" includes any new process or new technique and shall be construed without regard to whether or not a patent has been or could be granted, and the expression "public research" means research carried out by a Government Department or other public body or any other research in respect of which financial assistance is provided out of public funds. The Corporation is thus empowered to develop and exploit inventions over which the Government have the right of proprietor (*e.g.* inventions in the possession of Government Departments), and also those inventions emanating from private sources which are likely to be of benefit to the community and are not being adequately used already.

For its purpose, the Corporation may borrow up to £5 million from the Treasury within 5 years of its establishment, but it is expected to repay any such loans, and to pay its way in the long run.

For the moment correspondence should be addressed to the National Research Development Corporation, I.C. House, Millbank, London, S.W.1. (Telephone: Whitehall 5140).

# New Frozen Meat Packaging

## DEMONSTRATION OF THERMOPLASTIC WRAPPING

Carcasses as they arrive wrapped in Cry-O-Rap.

With the co-operation of the Ministry of Food, the Australian and New Zealand Meat Boards, the D.S.I.R., and the meat companies, samples of lamb packaged in thermoplastic wrapping were prepared and sent to England, and were exhibited at Smithfield Market on June 16. Representatives of the aforementioned bodies attended the demonstration.

The new type of synthetic film used to envelop the lamb was developed during the war by Dewey and Almy. Compounded of vinylidene-type co-polymer, it is odourless, tasteless, and flexible at low temperature. Its main claims to usefulness in connexion with transport of frozen meat are:

1. Its low moisture vapour transfer rate prevents dehydration and weight loss.
2. Freezer-burn is eliminated.
3. The original bloom is retained.
4. The development of rancidity is retarded.
5. Because of its ability to shrink tightly about the carcass, most of the air is eliminated from the package, and interior frosting is greatly reduced.

The Cry-O-Rap system operates in the following manner. The film is extruded in tubular form and converted into a bag. One end is left open while the other is sealed electronically and the bag is placed over a stuffing horn. The product to be packaged is placed in the horn and pushed into the bag. The package is vacuumised, a retractable vacuum tube inside the bag speeding up the process by preventing the bag from closing up between the vacuum nozzle and the product, while the operator holds the sides of the bag away from the contents. After heat-sealing, the bag is dipped in and out of hot water (180° to 195° F.) so that the film shrinks until it forms a skin-tight covering. A spray tunnel may be used for shrinking large quantities.

Lamb arriving from Australia and New Zealand has been penalised on the English market because of loss of weight and bloom. Earlier work had indicated that these losses could be lessened by wrapping the carcasses in an impermeable bag, and it was with this in mind that the present tests were carried out. Careful weight records were made throughout, and these will serve as a quantitative index of the effectiveness of the wrap. The first shipment shows an average loss of 2·3 per cent. for the stockinette-wrapped controls, and no loss at all for the Cry-O-Rap protected samples.

Interested visitors examining the bloom of the uncovered carcasses.

Livers and kidneys packaged in the material have been included in this test. Here again there has been no loss in weight, and as a result the appearance, bloom, and colour of these products have been maintained.

The preliminary indications are that the film provides an excellent protective covering for meats sent to England. Not only are expensive weight losses eliminated, but the products arrive with all their natural bloom.

Mr. B. A. Fairbank, director of the American research department, has been investigating the field for the method in Australia. His company has opened a factory at Lockport, near Niagara Falls, for the production of the film and plentiful supplies are available for export.

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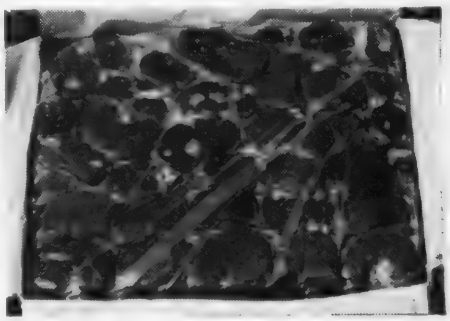
### British Engineers' Association

The Rt. Hon. Sir John Anderson addressed a large gathering of members of the British Engineers' Association at a recent luncheon held in London. In the course of his speech, Sir John said that today the engineering industry was a factor of outstanding importance in the economic life of the United Kingdom. He spoke of the need to take advantage of modern developments so that the industry could compete with the engineering industries of other countries. He felt that engineers should proceed to consolidate behind the line of scientific advance, treating scientists as partners and not as mere specialists.



A carton of kidneys.

A cheque for £22,984 is handed over by Mr. T. Wilson, President of the National Association of Master Bakers, to Dr. R. T. Colgate (*left*), chairman B.B.I.R.A., watched by Mr. Alfred Bostock.

## Red Letter Day at Chorleywood

The visit of H.R.H. the Duchess of Kent to Chorleywood Lodge formally to open the research Station of the British Baking Industries Research Association was referred to by Dr. R. T. Colgate, chairman, as an important milestone on the road of their endeavours to develop the Association for the benefit, not only of the baking industry, but also of the whole community. It was their purpose, he said, so to wed science and the baking industry that the public would be assured of purchasing the finest products, prepared under the best hygienic conditions, at the most economic level of production. After a speech by Mr. Herbert Morrison, during which he gave an assurance that the Government would continue to support research associations provided that industry played its part, Dr. Colgate handed the Duchess of Kent a key with which she formally opened the research station. Her Royal Highness then toured the laboratories and spoke to the employees. A gift cake 24 in. high, designed by the Bakery School of the Borough Polytechnic of London, was presented to the Duchess and at her request it was distributed among the guests.

Guests assembled in the reception hall to witness the unveiling by Mr. Victor Joseph of a plaque commemorating the gratitude of the industry to Mr. Alfred Bostock who inaugurated the Research Foundation Fund of £30,000 subscribed by the industry, and thus made possible the formation of the Association. After Mr. Bostock had replied, Mr. T. W. Wilson, the new President of the National Association of Master Bakers, Confectioners, and Caterers, handed over to Dr. Colgate a cheque for £22,984, this being the balance of the Foundation Fund.

## New Oil and Meal Plant

A new herring reduction factory for the production of oil and meal is to be established at Tarbert by the Herring Industry Board. This development has been welcomed in the area which has sought such a plant for a considerable number of years.

## Technical Literature

A small exhibition staged at the Grosvenor Hotel recently was devoted entirely to I.C.I. technical literature, the output of which is an important part of the company's technical service to industry. All publications are based on original research and practical experience.

## A.B.I.M. Officers

The following officers and executive committee will serve the Association of British Insecticide Manufacturers during 1949:

*Chairman:* Dr. J. R. Booer (F. W. Berk and Co).

*Vice-Chairman:* Dr. E. Holmes (Plant Protection).

*Hon. Treasurer:* Mr. N. K. Smith (The Murphy Chemical Co.).

*Hon. Auditor:* Mr. A. G. Ponton (Pan Britannica Industries).

*Executive Committee:* Mr. E. T. Bugge (Bugges Insecticides); Mr. A. T. Davey (Burt, Boulton, and Haywood); Mr. J. S. Mitchell (The Murphy Chemical Co.); Mr. J. E. R. Simons (Geo. Monro); Mr. N. K. Smith (The Murphy Chemical Co.); Mr. F. W. Sugden (Plant Protection); Mr. H. J. Jones (*ex officio*) (Hemingway and Co.).

## I.P.C.A. Appoint Officers

The following officers and executive committee have been appointed by the Industrial Pest Control Association for the year 1949:

*President:* Dr. F. P. Coyne (Imperial Chemical Industries).

*Vice-President:* Mr. R. P. Merritt (Stafford Allen and Sons).

*Hon. Treasurer:* Mr. C. Stuart Kregor (W. Edmonds and Co.).

*Hon. Auditors:* Mr. T. A. Acton (Pesticidal Services (Ireland)); Mr. C. L. Claremont (Rodent and Insect Pest Destruction Co.).

*Executive Committee:* Mr. R. G. Berchem (Jeyes' Sanitary Compounds Co.); Mr. S. W. Hedgcock (Chelsea Insecticides); Mr. Duncan R. Leitch (Ratsouris); Mr. S. F. Sprange (The London Fumigation Co.); Mr. J. B. Wilton (Fumigation Services); Mr. G. McLaren (*ex officio*) (Haller Laboratories).

*Secretary:* Mr. W. A. Williams, M.B.E.

## Director Tours Africa

Mr. J. L. Hindle, managing director of Standard Synthetics, has recently returned from a business trip during which he called on business friends in Alexandria, Pretoria, Johannesburg, and Capetown.

In spite of current restrictions on imports, Mr. Hindle believes the market for raw materials will expand in the Union of South Africa as local manufacturers will be forced to produce more goods to overcome the threatened shortage of imported finished products from the U.S.A. and Britain.

## International Master Bakers Discuss Trade Problems

The first post-war meeting of the Committee of the International Union of Master Bakers was held in the Imperial Hotel, Torquay, in June. Members present included representatives from France, Switzerland, Italy, Sweden, Holland, Luxembourg, Scotland, and England.

The Committee reviewed the general position and also the question of membership of the International Union. Reports were submitted of correspondence with associations in a number of countries who were not represented at the Paris Conference. Several of these, including Spain and Greece, expressed a desire to join.

A discussion then took place on the problem of the abolition of night baking and labour matters in the different countries.

The invitation to hold the next meeting of the Committee at the Swiss Bakery School at Lucerne, about the end of November, was accepted.

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## Dough Freezing to Replace Night Baking

The threat by the baking industry employees in Scotland to refuse to undertake night baking from September 9 may force a considerable expansion in the use of refrigerated space to retard dough. This system, which has been found satisfactory by several firms, permits production to be carried on to a given level the previous evening and the storing of the dough in a cold room equipped with a cold storage unit with forced draft. The following day production can be taken up from the point at which it was stopped.

The difficulty facing the industry is that of deciding on a fairly costly installation against a situation which may possibly be avoided by a last minute compromise.

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## Disposals Association Ended

The Pharmaceutical and Allied Chemicals Disposals Association which was formed in 1945 for the purpose of disposing of Government surplus stores of pharmaceutical products has now been wound up.

## Appointments

Mr. D. B. Pinkney has been appointed to the board of directors of Short and Mason; he has also been appointed assistant managing director of the company.

For several years before the war Mr. Pinkney worked in the industrial application engineering department of the company to which he returned in 1946. In 1948 he spent five months with the Taylor Instrument Companies in the U.S.A., studying the sales, engineering, and factory operations.

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Mr. S. B. Hainsworth, managing director of J. H. Fenner and Co. and associated companies, was recently appointed chairman of the Association of Solid Woven Belting Manufacturers. Mr. Hainsworth is a member of the Executive Committee of the Federation of Leather Belting Manufacturers of the United Kingdom, of the British Rubber Manufacturers' Export Committee, and of the Council of the Hull Chamber of Commerce.

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## Note to Subscribers

We have been informed of cases where copies of FOOD MANUFACTURE have reached subscribers some days late.

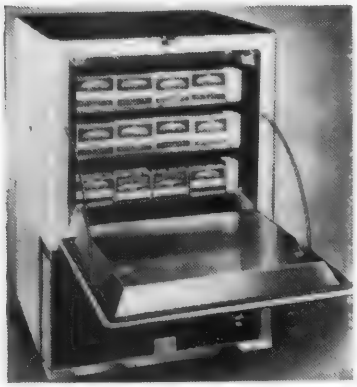
We have always made a point of ensuring that copies should arrive in subscribers' hands on the morning of the scheduled date and in this we have had the co-operation of our printers.

Unfortunately it has come to our notice that copies frequently lie in the post office for as much as two days before they are sorted and despatched, a matter over which, obviously, we have no control.

The Dakota is loaded up with containers before leaving for Belfast.

## And Now—The Belfast Airlift

As a result of the recent dock strikes in Avonmouth and Liverpool, an urgent shipment from the Metal Box Company of some 900 large lever lid drums for Benger's milk powder was strike-bound for several days until it was finally decided that an aircraft was the only answer. A Dakota was duly chartered, and it took off from Tollerton, near Nottingham, carrying what is believed to be the first load of empty containers ever to be airborne in this country. The load was flown to Belfast just in time to fulfil the customers' urgent requirements.



### Versatile Frozen Food Cabinet

Specially designed for the storage of frozen foods in a limited space is the new "Tasty-Freez" frozen food cabinet, which can also be used as an ice cream hardening box, ice cube maker, etc., made by King's Refrigeration Supplies.

Strongly built, with self-contained condensing unit, it has a capacity for storing 201 standard sized frozen food packets. It can freeze 240 lollipops in 3½ hours or about 80 lb. of ice cubes in the same period. One of its space-saving features is the drop-type door which forms its own self-contained shelf for loading and unloading and requires no extra shelf or counter space.

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### Electrical Accessories

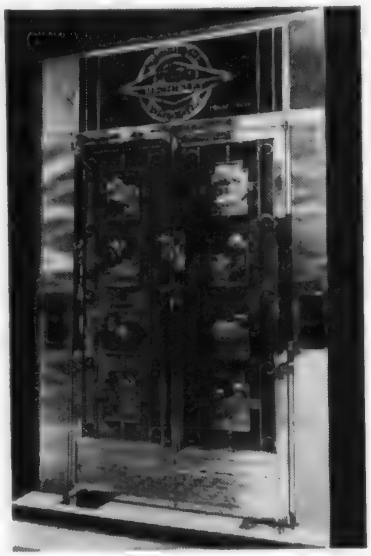
In addition to cables for marine and engineering applications, cell testers, lighting fittings, and lamps, the exhibits of Crompton-Parkinson at the Engineering and Marine Exhibition will include "Young" marine batteries and "Tong-Test" ammeters. Stud welding equipment for the electric arc welding of ferrous studs, pins, and similar items at the rate of dozens per hour, A.C. motors, and a 5 Kw D.C. generator will also be exhibited.

*

On show in London for the first time will be the "Flowstyle" equipment, a new Fisher and Ludlow development in unit-construction pressed steel mass-produced shelf, door, and drawer units, which can be assembled to form shelves, cabinets, cupboards, desks, etc. Also making a first appearance will be pressed steel pallets of various designs.

### Metal Box Reduce Prices

In April 1948, the business of Presscaps Limited, patentees of the reseal closure of the same name, was acquired by the Metal Box Company, who had for many years supplied Presscaps with the components for their product. Under the new arrangements and by reason of the wide facilities for marketing and service afforded by the larger organisation, it has been found possible to effect a considerable reduction, in many instances, in the manufacturing costs. The full reduction is being passed on to customers in the form of a revised schedule of prices, which took effect from July 1, 1949.



### Gates of Industry

In place of the old flush wooden doors, a pair of attractive stainless steel doors have been fitted at the Euston Road entrance to the office building of F. J. Edwards.

The door surround is plain, with a letter box each side bearing the name of the firm, while the firm's trade mark is cut from stainless steel sheet and fitted above the doors. A ruby glass is arranged behind the diamond. The centre of each door has four square panels with a design worked in *repoussé* depicting scenes from the engineering and sheet metal working industries. A tinted opaque glass is arranged behind each of the two sets of panels.

### Food Manufacturers Co-operate

In order to step up the quick freezing of pilchards, Shippams, meat and fish paste manufacturers, have lent three Jackstone Frosters to a Newlyn firm.

Last year some 400 tons of unfrozen fish were handled by the firm and passed on to the Shippam organisation. This year twice as many pilchards are expected, and they are to be frozen in 21 lb. blocks.

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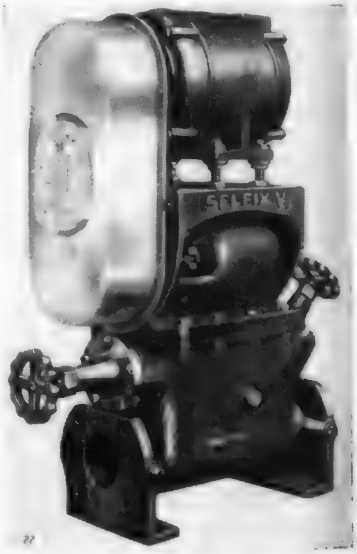
### Steamlined Hot Water Circulator

Incorporating many innovations, notably a mechanical gland seal which ensures complete freedom from leakage and gives trouble-free operation for long periods, a new silent Super Selfix Mark V circulator for low pressure hot water heating has now been added to the Holden and Brooke range of centrifugal pumps. A transparent plastic belt guard, which is non-resonant, affords complete protection of the drive, while the simple handwheel operation of screw down valves, arranged principally for isolation, also allows for capacity control if required. Immediately the circulator is closed down, an automatic self-seating non-return valve swings to the open position, providing full bore flow for gravity circulation. The closing of the suction and delivery valves isolates the pump, which can then be removed for inspection without emptying the system.



## Oatmeal to Stage a Comeback

Millers and farmers in Scotland are co-operating in a programme designed to bring back oatmeal as a staple item of food, from which position it has been ousted by newer-type breakfast foods. Efforts involve research which will aim at improving the keeping and other qualities of the product. Farmers are being asked to ensure improved dressing of oats and the screening of impurities.

Although the withdrawal of subsidy on a home-produced cereal such as oats and its retention on flour is opposed, a reintroduction of subsidy is not anticipated, consequently oatmeal will still be unable to compare favourably in price with flour or other prepared products.

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## Chemical Research

The annual "Open Days" of the D.S.I.R. Chemical Research Laboratory at Teddington were held this year on June 30 and July 1, when representatives of industry, Government Departments, universities, and research workers were able to see the work that is being carried on at present.

The five main branches of research are: (a) corrosion of metals; (b) organic chemistry; (c) inorganic chemistry; (d) radiochemistry; and (e) high polymers and plastics. The work of these groups falls within five categories, viz. researches leading to fundamental data; new methods and techniques; the conservation of essential raw materials; the utilisation of low grade and waste materials; and new materials and processes.

Tests are still in progress on the use of sodium benzoate in conjunction with sodium nitrite to prevent the corrosion of steel and other common metals and results are very encouraging. The use of these chemicals jointly incorporated in rubber latex holds considerable promise for the "temporary" protection of fabricated iron or steel parts during storage or transport. Machined surfaces covered in this way have remained perfectly bright under tests involving drastic conditions of humidity and moisture precipitation. When no longer required the film can be readily removed by simple "peeling."

Some of the guests at the luncheon held at the G.E.C. Wembley laboratories, during which Sir Harry Railing outlined research work carried out by the company.

## G.E.C. Chairman Stresses Need for Research

Speaking at a press conversazione held at the company's Wembley Laboratories recently, Sir Harry Railing, chairman of the General Electric Company, emphasised the pressing need for continued research in all branches of the industry if Britain were to maintain her lead in development, and keep the export market supplied with a quality product that is ahead of foreign competitors. Sir Harry disclosed that over £1 million a year was being spent on research by the company and nearly 1,400 scientific workers were continually engaged at the laboratories. Much research work has been and is being undertaken for the Government and such work is performed without financial gain.

Many industries are dependent on the products of the G.E.C. and the advances made in precision instruments for industry have benefited labour, producer, and consumer. The company among other developments pioneered research in this country of synthetic sapphires, and now produces the finest synthetic tubular sapphire in the world. Fluorescent lighting and its effect on foodstuffs was another G.E.C. development.

In responding, Mr. H. S. Pocock observed that it would be a calamity to research work in general if any thought of nationalisation entered into it; the proud achievement of personal creation cannot be "directed" from a Government chair, and if progress was to be made unhampered freedom must be maintained.

## Aslib Guide

Guide No. 3 (Beverages and Food) of the *Aslib Guides to Sources of Information in Great Britain* has recently been issued. Section 1 deals with relevant libraries and loan services and with the D.S.I.R., while Section 2 details the organisations in Great Britain which are the main sources of information on beverages and food. In the preface it is stated that references to commercial companies, and to educational establishments other than universities and university colleges (with the exception of Westminster Technical College which has been included because of its unique Hotel School) have been omitted. This is because particulars of these organisations are already available in trade directories and in such annuals as *Food Industries Manual* (Leonard Hill, Ltd.), and *Floodlight*, published by the London County Council.

Section 3 lists the publications referring to beverages and food, including periodicals, directories, annuals, and yearbooks.

The price of the Guide is 12s. 6d. net.

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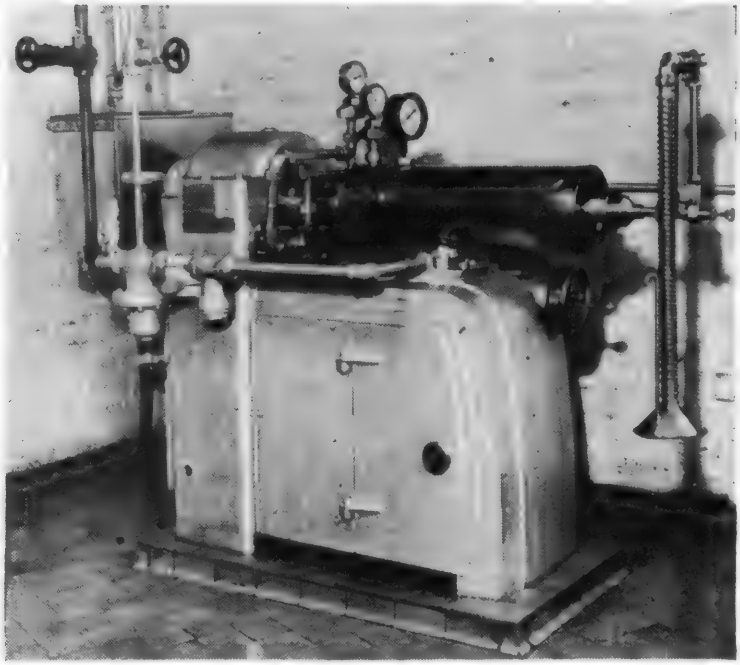
## B.S.I. Year Book

The Yearbook of the British Standards Institution, which has just been published, gives a subject index and a synopsis of each of the 1,500 British Standards now current. These standards have been prepared by representative committees of 55 different industries. The price is 5s. post free.



**The Vogt continuous instant freezer permits of direct packaging and a reduction in hardening time.**

### Food Processing Plant

A range of heat transfer equipment, viscolisers for all homogenising duties, Vacreators for combined flash pasteurisation, oxygen, and off-flavouring extraction, foam-free pumps, as well as processing vats for pasteurisation, ageing, and storage of liquid food products are items of Cherry-Burrell equipment, which, although designed primarily to serve the dairy industry, have now for some years found wide application in general food processing industries.

The company's Vogt ice cream equipment includes a continuous instant freezer, the fast, penetrating freezing action and close overrun control of which produces finished ice cream of fine texture and consistency. Delivery from the freezer takes place at a much lower temperature and in uniform quality and weight, thus permitting direct packaging and a reduction in hardening time.

Complementary processing units also supplied to the food processing industry include storage tanks, pumps, filters, hot water and detergent circulating units, valves, and pipe lines.

### Economic Engineering

"Co-partnership and Profit Sharing Schemes in Industry" and "Training within Industry" were the subjects dealt with at recent North-West and South London regional meetings of the Institute of Economic Engineering. These last meetings of the season are reported in detail in the June bulletin of the Institute, which also lists membership additions, an account of a meeting of the Redhill and District Discussion Group, and other items of interest to engineers.

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### Canning in Rural Scotland

A successful canning industry has been developed at Dalkeith in the Lothians, and a range of soups, with chicken a specialty, is being produced. The industry is working on a basis of cultivation of its own produce to supplement the supplies brought in from all over Scotland.

The success of this development is regarded as an indication that Scottish rural areas can support a greater number of canning units than have been visualised to date.

### Dollar Exports Board

The Council of the Dollar Exports Board comprises the following:

Sir Graham Cunningham, K.B.E. (Chairman); *Mr. E. A. Carpenter, O.B.E., J.P., President, Manchester Chamber of Commerce; *Mr. C. B. Colston, O.B.E., M.C., D.C.M., Chairman and Managing Director, Hoover, Ltd.; Sir Charles Hambro, K.B.E., M.C., Representing the Financial Advisory Committee; Sir Patrick Hannon, M.P., Representing the N.U.M.; *Mr. Laurence Heyworth, M.C., Director, Lever Bros. and Unilever, Ltd.; *Sir Percy Lister, Chairman, R. A. Lister and Co., Ltd.; Mr. John McLean, C.B.E,. Representing the A.B.C.C.; *Sir Leonard Paton, C.B.E., M.C., Director, Harrisons and Crosfield, Ltd.; Sir Robert Sinclair, K.C.B., K.B.E., representing the F.B.I.; Mr. H. V. Tewson, C.B.E., M.C., representing the T.U.C.

* Executive Members.

The Financial Advisory Committee on Dollar Exports has been set up by the Governor of the Bank of England in consultation with other financial and merchanting interests in the city to advise the Dollar Exports Board. The members of this Committee will be available to give advice on any financial or banking aspect of Britain's Dollar export problems. This Committee consists of the following:

Sir Charles Hambro, K.B.E., M.C., a Director of the Bank of England and a Managing Director of Hambros Bank, Ltd.; Mr. Julian Crossley, Chairman of Barclays Bank (D.C. and O); The Hon. Geoffrey Gibbs, C.M.G., a Managing Director of Antony Gibbs, Chairman of Exports Credits Guarantee Dept. Advisory Council; Mr. W. J. Keswick, a Director of Matheson and Co.; Sir Edward Reid, O.B.E., a Managing Director of Barings, Chairman of Accepting Houses Committee; Mr. O. E. Wood, Joint General Manager of Midland Bank, Ltd.

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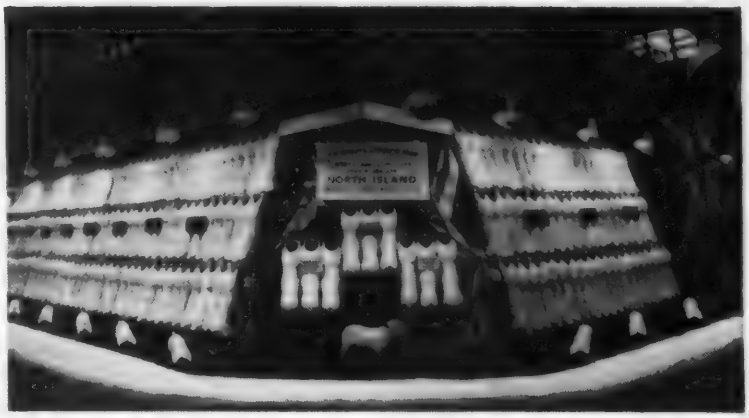
### London Office Closed Down

All technical and sales matters for Small Electric Motors are now being dealt with at the head office and works at Beckenham. The London office at Terminal House, Grosvenor Gardens, London, S.W.1, has been closed down. The registered office is at Gresham House, Old Broad Street, London, E.C.2.

## Meat Market Illumination

Illumination at the recent London Central Meat Marketing Exhibition of New Zealand lamb was provided by parabolic angle units, finished in "Crysteel" vitreous enamel. Made by Benjamin Electric, there are approximately 4,000 of these units installed in Smithfield Market. All these reflectors have been in constant use for over twenty years, and in spite of a certain amount of grease in the atmosphere and their being cleaned merely with mutton cloth, the units still retain full reflection efficiency.




Illumination at the recent London Central Meat Marketing Exhibition was provided by parabolic angle units.

## B.F.M.M.A. Annual Luncheon

At the annual luncheon of the British Food Machinery Manufacturers' Association at the Savoy Hotel on June 14, the chairman, Sir Harry Gilpin, welcomed Mr. G. R. Strauss, Minister of Supply, as their principal guest. Mr. Strauss paid tribute to their ingenuity and the manufacturers' co-operation in the national interest. The nation, he said, was in their debt; but because it was not a spectacular industry, it was almost entirely unknown to the general public, and little recognition was given to the engineering and scientific skill that went into their work. British food machinery manufacturers had provided the finest equipment and some of it was unobtainable from any other country.

## Caterers' Association

At the annual election of officers of the Caterers' Association of Great Britain Lord Woolton was re-elected President. The following elections to the Council were also made: Mr. T. Edward Beale (chairman); Mr. E. W. Collinson (life member); Messrs. A. Ernest Burdett, D. Cameron-Swan, and Kenneth Hall (re-elected vice-chairmen); Messrs. E. Vivian Rogers and Julian Salmon (two additional vice-chairmen); Mr. Leslie W. Slark (re-elected hon. treasurer).

To fill two vacancies on the executive committee, Messrs. A. Mervyn Hampton and C. Belfield Smith were elected from the Council.

H.R.H. The Duke of Gloucester inspects the Prestcold churn immersion milk cooler during his visit to the Leicester and Leicestershire Industries and Trade Fair. With him is the Lord Mayor of Leicester.

## Design Exhibition from Chicago

All interested in the subject of industrial design had an opportunity of studying methods of design training employed in the U.S.A. at an exhibition held in London recently by the Council of Industrial Design. Secured on loan from the Chicago Institute of Design, the exhibition demonstrated by means of diagrams and photographs the principles and methods of instruction employed at the Chicago Institute.

## Master Bakers' Annual Report

The continuation of controls in the baking industry has resulted in an increase in the number of problems with which the National Association of Master Bakers, Confectioners, and Caterers have had to deal during the year 1948-49. The Executive Committee state in their annual report that the international aspect of the Association's work has assumed greater importance; during the year representatives attended an International Congress in Paris, and visits have been received from members of the industry in different parts of the world.

Much attention has been focused recently on the question of the need for some new type of organisation in the baking industry. The Re-organisation Committee set up by the N.A. Council in 1948 has not yet been able to prepare a complete scheme, but an interim report was submitted to the 62nd annual conference of the Association held at Torquay last June.

## Booklets Received

The report made by Mr. A. P. Young, O.B.E., chairman of the Institution of Works Managers, on his visit to the U.S.A. to study American management techniques and practices, has now been published.

*

A new type of solvent extractor, suitable for the treatment of vegetable seeds which hitherto it has not been possible to extract economically in a continuous way, is described in the fifth bulletin in the series on this type of plant issued by Bamag. The plant is also suited for the extraction of other material such as fish meal.

■

It is said that "handling adds nothing to the product except cost." How this cost can be reduced by mechanised handling is described in *A Survey of Material Handling* recently produced by Fisher and Ludlow. The survey, which is written in non-technical language and is well illustrated, includes a list of the products of the firm's material handling division.

*

Short-time pasteurisation plant for the smaller dairy, consisting of the Paraflow, types H.T.C.A. and H.T.A., a continuous filter, a tubular holder, a balance tank, pump, and flow controller, and a panel unit containing the flow diversion valve and hot milk temperature recorder, is described in a new A.P.V. publication. Stainless steel reaction vessels which have numerous applications in the chemical and food industries are dealt with in leaflet No. S.24, also recently produced by the company.

■

Constructed on the mercury expansion principle, a range of dial thermometers, temperature recorders, and indicating and recording thermometers are described in detail in a booklet recently issued by Negretti and Zambra. The readings of the dial thermometers of temperatures up to 600° F. are guaranteed correct to within ½ per cent. and above this temperature to within 1 per cent. of the total range; the readings of the temperature recorders are guaranteed correct to within 1 per cent. of the total range.

## OBITER DICTA

● Mammoth strawberry shortcake topped with gobs of 40 per cent. whipped cream.—*Restaurant menu in Daytona Beach.*

● One could wish that the Government would put something into our tummies and not R.I.P. on our tombstones.—*Mr. D. C. M. Nicholls at Exmouth Sessions.*

● The reason for the sweet shortage is that the nation has a sweet tooth the size of which we could not assess. — *Dr. Edith Summerskill.*

● As things are at present, we, as a trade, are in the lowest depths we have ever been; we are not traders today but just meat cutters. — *Mr. Caradoc Jones.*

● If everyone ate home-grown wholeberry wheat bread, we could shut the hospitals. The House of Lords rags me about it, calling me Uncle Wholemeal, but I don't mind.—*Lord Teviot.*

● It is almost impossible for a person to suffer from insufficient calories in this country, given unrationed food like bread. — *Dr. H. E. Magee, senior medical officer, Ministry of Health.*

● Our American hosts leave in one week enough meat on the side of the plate to constitute a Briton's meat ration.—*Mr. Gavin Fisher, assistant director of the British Rayon Federation.*

● At any rate it's the best we've got. We're like little children now in the meat trade. We "close our eyes and open our shops, and see what the little official gods will send us." —*Hambletonian in "The Meat Trades' Journal."*

● The enthusiasm and imagination of a reporter in America multiplied the four steaks I had been given, weighing under 5 lb., into twelve steaks weighing 3 lb. each. But I brought back only one-tenth of the food allowed. — *Sir Hartley Shawcross.*

● So long as the Ministry of Food can find the quantity, quality appears to be of secondary consideration. The food distributive trade could render a service by insisting on better quality. — *Mr. T. K. Bamford, President of Manchester Provision Exchange.*

## Company News

A dividend at the rate of 12½ per cent., less income tax, was proposed by the directors of Lipton's in their report for the financial year ended January 1, 1949.

■

A dividend at the rate of 9 per cent., less income tax, on the ordinary shares, was recommended by the directors of the Home and Colonial Stores in their report for the year ended January 1, 1949.

■

Considerable growth of sales was evident from the accounts to March 31 last of Smith's Potato Crisps (1929). The customary 32½ per cent. distribution on the parents' £876,200 issued one-class capital came from combined earnings of 41 per cent.

■

Another successful year in the company's history was reported by the chairman, Lord Luke, at the fifty-second annual general meeting of Bovril. A final dividend on the deferred stock of 10 per cent., making 12½ per cent. for the year, was recommended, after paying the dividends to December 31, 1948, on the pre-preference, preference, and ordinary stocks.

■

A final dividend of 8s. 6d. per £1 unit on ordinary and "A" ordinary stocks (making 4s. 6d. per £1 unit for the year), and a final dividend of 8s. 4d. per £1 unit or share respectively on the proportional profit stock and "B" proportional profit shares (making 10s. 8d. per unit or share for the year) was proposed in the fifty-fifth annual report of the directors of J. Lyons and Co. for the year ended March 31, 1949.

■

Presiding over the twenty-fourth annual general meeting of H.P. Sauce, Sir Patrick J. Hannon, M.P., chairman of the company, said that the results of the year's trading in the parent and subsidiary companies had been satisfactory. Payments of dividend, less tax, on the seven per cent. cumulative preference stock made on July 1, 1948, and January 1, 1949, and the interim dividend of 6d. per unit, less tax, on ordinary stock made on September 30, 1948, were confirmed, and a final ordinary dividend at the same rate as last year was agreed upon.

# News from Overseas

### Butchers' Exhibition in Germany

A Butchers' Exhibition, in which foreign firms also participated, recently took place in Frankfurt-on-Main. Exhibits included cutlery, butchers' implements, tools, machinery, boilers, refrigerators, shop equipment, pickling apparatus, spices, preserving agents, meat and sausage products, tinned meats, tins, artificial casings, packing material, butcher's linen, and professional clothing.

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### Italian Food Industries

The programme of reconstruction and modernisation of Italian food factories has now been accomplished.

The principal flour mill firms number 1,230 units, capable of turning out 9,000 million tons of flour. There are 2,350 firms engaged in making various types of macaroni with a total potential output of 2,400,000 tons.

The canning and preserving industry accounts for 1,600 factories; 1,300 of these are occupied with vegetables while the rest deal in sausage and canned meats.

The output of the dairy industry is back to its pre-war level. During 1948 220,000 tons of cheese, 40,000 tons of butter, 600 tons of condensed milk, and 1,000 tons of powdered milk were produced.

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### Shark-hunting off Donegal

As a first step in the development of a hitherto unexplored aspect of Ireland's fishing industry, an expedition recently left Howth to hunt sharks off the Donegal coast. Organised on lines similar to the whale hunts in the Arctic, although on a much smaller scale, the expedition, which consisted of a "mother vessel," a steam drifter, and two smaller fishing vessels, has been backed by a new company to be known as Marine Products Co., Ltd.

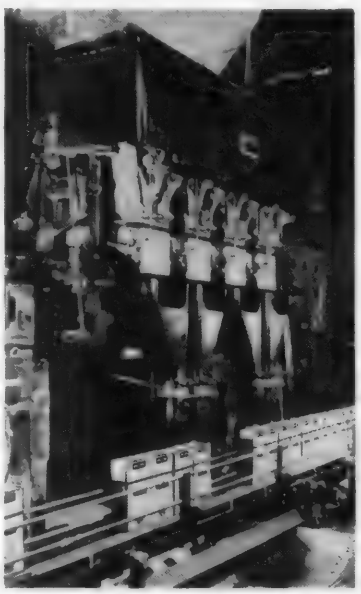
The sharks sought by the expedition are known in Ireland as sunfish or basking sharks which weigh from 5 to 10 tons each. The fish are valuable for their liver from which an oil with many commercial uses is extracted.

### Australia to Can Oysters

Japanese oysters are to provide the basis for an Australian oyster canning industry. These oysters produce a large, rather coarse meat which is usually used for processing and is not comparable in flavour or texture with the Australian product for eating fresh.

First shipment of seed oysters from Japan was made in 1947, and the oysters were planted out in Oyster Bay in Western Australia and at Pittwater in Tasmania. The latest consignment was brought by C.S.I.R. Division of Fisheries from Hiroshima by sea. As the growth and survival rate of the oysters placed in Oyster Bay in 1947 was poor, the new arrivals were all distributed at Pittwater, where growth and survival had been good.

There is now a stock of approximately 400,000 seed oysters at Pittwater. In the summer of 1949-50 the 1947 shipment should be ready to spawn, and those of the 1948 shipment in the following year. If spawning and spat fall are successful the present stock should make an adequate foundation for the oyster canning fishery.



A pneumatic 4-scale net weight weigher in operation at the plant of V. La Rosa and Sons in Brooklyn, New York.

### Wrapped Butter from Denmark

The new Anglo/Danish butter contract coincides with the arrival of small quantities of wrapped butter and firkins (56 lb.), instead of the cwt. casks, coming direct to London to be collected by importers and wholesalers to avoid the cold storage delays. Similar arrangements for the collection of butter direct from the docks have been operating in Newcastle for some time.

The wrapped butter is in 1 lb. packets supplied in 28 lb. boxes. It embodies the results of recent lengthy experiments in Denmark and breaks new ground in butter packaging on the British market. The wrapping is of parchment-lined aluminium foil. Similar butter wrappings of aluminium foil have been used for some time in Switzerland and U.S.A., and the new Danish packing is the latest development in this field.

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### Food Convention in U.S.A.

America's leading food scientists and technologists met at the 9th Annual Convention of the Institute of Food Technologists held in San Francisco recently, when 125 papers dealing with research and technological advances in food processing were read.

One evening programme was devoted entirely to Californian wines. Discussions ranged from research and processing problems to medical aspects and wine cookery. A colour film on wine-growing in America was shown, and the programme concluded with the tasting of typical California brands.

The rest of the week was taken up with discussions, visits to the Napa Valley wineries, San Jose canning industries, Stanford University, the Berkeley cyclotron, the Western Regional Laboratories, and a day of relaxation including a barbecue at Los Altos.

Among several awards made was the Food Industries Award, presented by Dr. W. V. Cruess of the University of California, who is one of the charter members of the Institute, its former president, and recipient of a Nicholas Appert Award.

In the baking department bread dough is weighed, formed, and shaped, then moves through the proofer from which it emerges for tinning up.

### Food Service in America

Virtually a giant refrigerator, the University of Michigan Food Service Building which has just come into service has offices strategically arranged and a kitchen, conveniently placed near the dietitian's office, for testing recipes and foods.

In addition to a receiving section, the first floor comprises a bakery, a meat processing shop, and an ice cream manufacturing department capable of making 7,000 gallons of ice cream a month.

The second floor is used for storage and a section refrigerated for meats and deep freeze storage. The basement of the building, which is largely refrigerated, contains a section where grocery orders are made up and the shipping room where trucks are backed in under cover and loaded with items which go out to the various dining halls.

The well-designed bakery, not yet in full production, produces over 7,000 loaves of bread, 8,340 dozen cakes, pies and assorted sweet rolls, coffee cakes, doughnuts, etc., and over 800 gallons of ice cream and 1,800 Dixie Cups weekly. Products go to a hospital and are sold for profit as well as being used to satisfy 5,200 students. All flour is kept at a temperature of 70° F. and 45 per cent. humidity. Flour is brought through chutes to the bakery, where it is automatically weighed on specially designed scales. Two Artofex mixers are used for all sponges and doughs; after mixing, the dough goes to the fermentation room, which is kept at a temperature of 80° F. and 78 per cent. humidity. Following four hours in the fermentation room the bread goes to the re-mix department, to the one-pocket divider, the moulder, and the T-type four-rack, overhead, air-conditioned proofer. The gas-fired bread oven has a capacity for 1,000 loaves per hour. A full line of speciality breads is produced, and all bread is wrapped. A retarding box with a temperature of 34° F. and 85 per cent. humidity is used for retarding unfinished baked goods prepared and ready for baking. There is also a walk-in cooker for storing pie fruit, yeast, shortening, etc., at temperatures between 32° and 50° F.

All utensils are washed in a sterile solution after use and a high sanitation standard is maintained.

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### S. Africa to Export Sugar Again

The sugar industry in Natal, South Africa, is shortly to resume exports to Great Britain. In the pre-war period considerable quantities of sugar were exported, but the internal demand increased to such an extent that during the past few years there has been difficulty in meeting even this demand.

The resumption of exports, although on a relatively small scale, is an indication that production has now caught up with this demand and it is anticipated that, unless a long period of drought intervenes, the export surplus will continue to increase in the future.

## Removing Meat from Moulds

### CHICAGO FACTORY SOLVES THE PROBLEM

Various methods have been tried from time to time to discover a satisfactory way of removing meat, such as cooked ham and luncheon meat, from the moulds in which they are cooked under ratchet pressure. One method used is to hit the bottom of the mould on the table, to break the bond that has formed between the meat and the mould by the juice extruded from the meat, and then free the product with quick jerky moves of the inverted mould. The objection to this practice is that it is time-consuming and frequently results in damage to the mould.

A novel solution to the problem has been adopted in a Chicago factory. A hole of $\frac{3}{8}$ in. diameter is drilled in the centre of the bottom of moulds used for hams and cooked loaves. The hole is reamed slightly on the outside of the retainer, and a self-closing air valve, the outer tip of which is bevelled to fit into the opening in the mould, is hooked up at the washing table. The full moulds are brought to this table, and after the lid is removed, the mould is lifted bottom side up so that the air valve fits into the mould opening. A slight tilting of the mould opens the air valve, which then admits an even air pressure throughout the retainer, forcing out the meat. Being admitted in the centre, the air moves in an even manner throughout the space between mould and loaf, assuring quick removal of the product.

# News from the Ministries

### Canned Sweet Puddings

Canned sweet puddings have been freed from price control, and the Canned Puddings (Maximum Prices) Order as amended has accordingly been revoked as from June 18.

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### De-allocation of Cocoa Beans

The de-allocation of cocoa beans as from June 9 was recently announced by the International Emergency Food Committee of the FAO Council. This decision was based on the recommendation of the IEFC Committee on cocoa which, after reviewing the supply and demand position of cocoa beans, determined that current supply was sufficient to meet effective demand.

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### Meat Trade Committees Appointed

The following Committees have been appointed by the Minister of Food: (1) the Meat Products Working Party to investigate and make recommendations concerning hygienic conditions in the meat manufacturing trades; and (2) the Interdepartmental Committee on Meat Inspection, to review present arrangements for the inspection of home-killed meat.

Mr. S. W. Hood, C.B., has been appointed chairman of the Meat Products Working Party; other members include officers of the Ministry of Food and various Health Departments, as well as representatives of the meat manufacturing trades and associations.

The Working Party's terms of reference are:

The Interdepartmental Committee on Meat Inspection is composed of officials from the Ministry of Food, the Health Departments in England and Wales and in Scotland, and the Ministry of Agriculture and Fisheries. Mr. G. R. Oake (Ministry of Food) has been appointed chairman.

The Committee's terms of reference are:

Mr. W. J. B. Hopkinson (Ministry of Food) has been appointed Secretary to the Working Party and to the Interdepartmental Committee. All communications should be addressed to him at 47, Portman Square, London, W.1.

### Cod Liver and Veterinary Oils

As supplies are now more plentiful, the Minister of Food has decided that it is no longer necessary to license the manufacture of cod liver oil.

The Cod Liver Oil and Veterinary Oil (Control) Order has accordingly been revoked as from July 1, 1949.

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### Australian Mutton and Lamb

Agreement was recently reached in London between the Ministry of Food and the Government of the Commonwealth of Australia on the prices to be paid by the United Kingdom for the purchase of mutton, lamb, and the relative offals for the year beginning July 1, 1949. This is in accordance with the terms of the bulk purchase agreement which provide for an annual review of prices.

The new prices represent a small increase over those previously payable and are calculated to cover some increase in Australian costs of production, and to bring forward the maximum quantities of meat for export to the U.K.

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### Butter Contract with Denmark

Following recent negotiations between the Danish Butter Export Committee and the Ministry of Food, agreement has been reached for a six-year contract under which Denmark will send the United Kingdom 75 per cent. of her annual exportable surplus of butter with a maximum of 115,000 tons in any year. The contract will begin on October 1, 1949, when the current contract expires, and end on September 30, 1955.

The price for the first year from October 1, 1949 to September 30, 1950, will be 271s. 6d. per cwt. f.o.b. Prices for subsequent years will be subject to annual review with maximum variations in any year of 7½ per cent. above or below the price for the preceding year.

Under the current one-year contract which ends on September 30, 1949, Denmark undertook to supply not less than 60 per cent. of her exportable surplus of butter at a price of 321s. 6d. per cwt. f.o.b.

### Flour Confectionery Prices

Following his review of the maximum price structure of flour confectionery, the Minister of Food has decided that he cannot at present make any modifications, but he will examine the question again in the autumn.

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### Sack Charges for Beans and Peas

The Beans and Peas (Sack Charges) (Amendment) Order, 1949, amending the Home Grown Beans and Threshed Feeding Peas (Sack Charges) Order, 1948, has been made.

The effect of the amending Order, which came into force on July 1, 1949, is to increase the permitted addition for non-returnable sacks from 1s. 3d. to 1s. 5d. per cwt. of contents (or from 1s. 6d. to 1s. 8d. per cwt. on a sale of less than 1 cwt.).

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### Concentrated Grape Juice

Limited quantities of concentrated grape juice, for use in the production of British wines, may be imported under specific licence from France, Greece, and Cyprus during 1949. Applications to import supplies from other sources will also be considered.

For administrative convenience, applications for import licences should be addressed to the Board of Trade through the Ministry of Food, Fruit Products Division, Portman Court, W.1. They should be accompanied by evidence of firm offers.

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### Eggs from Denmark

Agreement has now been reached between the Ministry of Food and the Danish Egg Export Committee on the supply of Danish eggs to the United Kingdom during the year October 1949 to September 1950.

As last year, Denmark will again send 85 per cent. of her exportable surplus to this country. The average price over the whole year will depend upon the quantities shipped, but it will be lower than it was in 1948-49. It is expected that larger supplies of eggs than last year will be arriving from Denmark during the coming year.

# International Whaling Commission

## RESOLUTIONS PASSED AT FIRST MEETING

Under Article III of the International Convention for the Regulation of Whaling signed at Washington on December 2, 1946, the contracting governments agreed to establish an International Whaling Commission composed of one member from each contracting government.

The main duty of the Commission is to amend from time to time the provisions of the Schedule to the Convention, which are, in effect, the regulations governing the conduct of whaling by the contracting governments. These regulations deal with conservation and utilisation of whale resources generally, including fixing (a) protected and unprotected species; (b) open and closed seasons; (c) open and closed waters, including the designation of sanctuary areas; (d) size limits for each species; (e) time, methods, and intensity of whaling (including the maximum catch of whales to be taken in any one season); (f) types and specifications of gear and apparatus and appliances which may be used; (g) methods of measurement; and (h) catch returns and other statistical and biological records.

This Commission is also to be charged with the duty of taking action, either independently or in collaboration with other governments and public or private agencies, to:

(*a*) encourage, recommend, or, if necessary, organise studies and investigations relating to whales and whaling;

(*b*) collect and analyse statistical information concerning the current condition and trend of the whale stocks and the effects of whaling activities thereon;

(*c*) study, appraise, and disseminate information concerning methods of maintaining and increasing the populations of whale stocks.

At the Commission's first meeting held in London recently Professor B. Bergersen (Norway) was elected chairman, Dr. Remington Kellog (U.S.A.) was elected vice-chairman, and Mr. A. T. A. Dobson (U.K.) was appointed secretary of the Commission. Various committees were constituted to review the restrictive and other Articles of the 1946 Convention and the Schedule attached thereto. Any alteration of the Schedule requires a three-fourths majority and comes into force only after being deposited for the various periods set out in the Convention.

Although a number of amendments to the Schedule were exhaustively discussed, the only resolutions which the Commission passed by the necessary majority vote were in respect of the following:

(*a*) the pelagic whaling season, which it was decided to alter;

(*b*) the total ban on the taking of humpback whales south of 40° south latitude, which it was decided to relax slightly;

(*c*) for clarification purposes, it was decided to redraft paragraphs 10 and 17 of the Schedule to the Convention relating to land stations, and factory ships in territorial waters, respectively.

These alterations will not come into force until notified to the contracting governments, and until the necessary periods for which the alterations have to be deposited have expired.

For the present, the office of the Commission will be at the Fisheries Department, St. Stephen's House, Victoria Embankment, Westminster, London, S.W. Normally the Commission will meet once a year, and the next meeting has been provisionally fixed for the middle of July, 1950, at Oslo.

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### Imported Preserves

The Preserves Order has been further amended so as to free imported jams and marmalade (but not imported honey) from price control as from June 19.

Substantial quantities are now available from the United Kingdom's principal sources of supply (South Africa, Australia, and the British West Indies), and it is expected that prices will fall.

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### No Labelling Order for Beer

An Order with effect from July 1, 1949, has been made, under which beer brewed in the United Kingdom will continue to be exempt from the requirements of Article 2 of the Labelling of Food Order, 1946.

The exemption will be reviewed in June, 1950.

# Feedingstuffs Regulations Amended

## MANUFACTURE AND PRICES AFFECTED

The Feedingstuffs (Manufacture) Order, 1949, which came into force on June 10, replaces the Feedingstuffs (Regulation of Manufacture) Order, 1948, as amended.

The principal effects of the new Order are as follows:

(1) The provision exempting the drying of grass from licensing requirements is extended to apply to the drying and grinding of grass or other green fodder crops.

(2) The provision which limited the production of compounds, concentrates, and livestock mixtures by licensed manufacturers to 100 per cent. of production in 1938-39 is removed. Although total supplies of feedingstuffs are still below the pre-war level, the proportion of these supplies which is now drawn in the form of compounds is higher than before the war. The change means that licensed manufacturers will now be permitted to produce compounds up to the quantity represented by the ration documents tendered by their customers.

(3) Various changes are made in the schedules affecting the composition of compounds. The general effect of these changes is to allow licensed manufacturers greater freedom in their use of ingredients.

(4) The provision relating to the war-time manufacturers' organisation known as Conpro, Ltd., is removed as this organisation is being wound up.

The Feedingstuffs (Prices) Order, 1949, has been amended to prescribe basic prices for various imported and processed cereal feedingstuffs for the cereal year beginning July 1, 1949, the date on which the amending Order came into force. These changes result from the new growers' prices for home-grown grains.

The Order also prescribes basic prices for imported grain sorghums and imported extracted soya bean meal.

# Information and Advice

## Strychnos Innocua

B.3558. *I shall be glad if you will furnish me with information on the plant* Strychnos Innocua *which was mentioned in your April, 1948, issue as a source of vegetable oil of high quality in South Africa.* (India.)

*Strychnos Innocua,* or "M'Kwakwa," is a shrub or small tree which occurs in the Transvaal and frequently in the valleys of Zululand and Portuguese East Africa. It extends through the tropics as far north as Nubia in the Nile land. This shrub bears a hard-shelled spherical fruit about 2¼ in. in diameter and of a light brown colour. The fruit contains several flat, broadly oblong seeds embedded in a cream-coloured pulp which is pleasant to eat.

The dried fruit has the following composition:

| | | | |
|---|---|---|---|
| Shell | ... | ... | 32·6 per cent. |
| Kernel | ... | ... | 29·2 „ „ |
| Pulp | ... | ... | 38·2 „ „ |

The pulp which surrounds the seed is oleaginous and contains 29·3 per cent. of oil, 20·7 per cent. of sugar (as sucrose), and 0·7 per cent. of nitrogen expressed in the dried material.

A sample of the oil from the pulp examined at the Imperial Institute in 1929 was bright orange in colour with a slight deposit of stearine. Its analytical data were:

| | | | |
|---|---|---|---|
| Specific gravity at 15·5/15·5° C. | ... | | 0·9172 |
| Refractive index at 40° C. | ... | ... | 1.461 |
| Acid value | ... | ... | 9·0 |
| Saponification value | ... | ... | 191·6 |
| Iodine value (Wijs, 3 hours) per cent. | | | 74·7 |
| Unsaponifiable matter, per cent. | ... | | 1·4 |
| Solidifying point of fatty acids | ... | | 32·2° C. |

## Ice Cream Powders

B.3516. *We should be glad if you could let us have recipes for a good ice cream powder.* (Ireland.)

A hot process ice cream powder usually permits a better mix to be prepared than does an ordinary cold mix powder. This is because more ingredients can be added to a hot mix than to a cold one.

For use in Ireland, or in other places where liquid milk is available for mixing with the powder, the following formula for a hot process powder can be used:

| | | | |
|---|---|---|---|
| Cornflour | ... | ... | 6 lb. |
| Milk powder (spray) | ... | ... | 4 lb. |
| Sugar (powdered) | ... | ... | 10 lb. |
| Flavour | ... | ... | *q.s.* |

The ingredients should be thoroughly mixed. Either skim or full cream milk powder should be used; the former will keep fresh longer, but the latter will give the richer mix. In either case a spray of process milk powder should be used because it is more easily reconstituted than the roller process product.

This ice cream powder contains about 50 per cent. of the total quantity of sugar required in the finished ice cream. The balance must be added by the ice cream manufacturer, who will be able to adjust the degree of sweetness to suit the requirements of his trade.

To make one gallon of mix, 10 oz. of sugar is added to 20 oz. of the ice cream powder. A smooth cream is made with the dry ingredients and sufficient milk from one gallon of full cream milk. The remainder of the milk is heated to 200° F. and held at that temperature long enough to cook the cornflour. After emulsification or homogenisation, the mixture is cooled as rapidly as possible and frozen.

By adding 12 oz. butter or margarine and 1 oz. of glyceryl monostearate, the total fat content can be raised to 8 or 9 per cent. and the total solids content to about 32·5 per cent., which is well up to average. The butter (or margarine) and the emulsifying agent should be melted in a separate pan and added to the other ingredients when the mix has reached about 150° F.

If the addition of fat is not desired, 3 lb. of soya flour of high fat content can be included in the original ice cream powder, thus increasing both the fat and the total solids contents of the final product.

For a cold process ice cream powder, the following formula should prove satisfactory:

| | | | |
|---|---|---|---|
| Milk powder (spray) | ... | ... | 4 lb. |
| Gum tragacanth (powder) | | ... | 1 lb. |
| Sugar (powdered) | ... | ... | 11 lb. |
| Flavour | ... | ... | *q.s.* |

Sixteen ounces of the powder are required per gallon of mix, using full cream milk. The addition of 13 oz. of sugar will give the final product the pre-war content of 13·3 per cent. The fat content will be 3 or 4 per cent., according to whether or not a full cream milk powder is used.

The fat content can be increased by adding fresh cream. The former should contain 50 per cent. and the latter about 35 per cent. of fat. The quantity that can be added is limited by the necessity of keeping the total proportion of milk-solids-not-fat at a level that will prevent risk of sandiness. Four ounces of cream can safely be added; this would raise the total fat content to about 4 per cent. and the total solids content to about 29 per cent.

Butter essence or cream essence, colouring, and additional flavourings can be added to both hot and cold mixes if desired.

## Information Supplied

B.3530. *Manufacturers of dried vegetables.* (London.)

B.3533. *Manufacturers of small hand-operated hoists.* (Glam.)

B.3540. *Suppliers of locust bean syrup.* (Derby.)

B.3542. *Suppliers of meat extract.* (Hants.)

B.3544. *Suppliers of coffee essence plant.* (New Zealand.)

B.3545. *Manufacturers of egg cracking and separating machines.* (London.)

B.3546. *Suppliers of cheese straw machinery and manufacturers of machinery for ice cream wafers and cornets.* (Lancs.)

# Recent Patents

*These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. 6d. weekly (annual subscription £3 15s.).*

## Specifications Published

*Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 2s. each.*

617,942. KRONBERGER, H.: Arrangements for measuring or indicating the flow of liquids.
620,245. HARDWICK, R. J.: Potato chipping machines.
620,320. HOWARDS AND SONS, LTD., ADCOCK, L. H., CLARK, G. C. H., and LOCK, R. H.: Manufacture and use of dehydrated lactic acid.
620,362. BAKER PERKINS, LTD., and WILSON, G. D.: Travelling conveyor baker's ovens.
620,383. THEODORE, D. T.: Manufacture of coffee concentrate.
620,417. BAKER AND CO., INC., W., and MARS, INC.: Edible chocolate products.
620,570. HUZENLAUB, E. G., and ROGERS, F. H.: Steam treatment of cereal grains.
620,610. ADEKO WAFELBAKKERIJ C.V.: Method for the manufacture of brittle treacled sandwich wafers.

## Abstract of a Recent Specification

### High Pressure Cooking Devices

This invention relates to cooking devices usually known as high pressure cookers or sterilisers in which the cooking or sterilising of materials such as bones, meat, fish, or vegetables, is effected on the retort principle by means of steam applied under pressure.

In cooking devices of this character, difficulties have been experienced in distributing the steam through the retort at the required pressure so as to enable the material in the retort to be thoroughly cooked and processed.

It is accordingly the main object of the present invention to overcome this disadvantage. It consists of a high pressure cooker or steriliser of the kind referred to comprising a retort for containing the material to be cooked or sterilised, a plurality of inlets for supplying steam under pressure to the retort at positions spaced apart from one another, and means for separating out or collecting any liquid by-products produced during the cooking or sterilising process, the inlets being so arranged that steam on entering the retort is applied to oppositely disposed surfaces of the material to be cooked or sterilised at substantially equal pressure without entering or agitating any liquid by-products.

The invention also provides a high pressure cooker or steriliser comprising a retort having a perforated false base or partition spaced apart from the main base of the retort and two steam inlets one of which opens into the retort above the false base or partition, while the other is spaced apart from the first inlet and opens into the retort below the false base or partition, whereby the cooking or processing of material disposed in the retort is effected by steam supplied through both the inlets at substantially equal pressure without the residue or liquid by-products coming into contact with the material being processed and without substantial agitation of such material.

613,604. *John Bell Busby and John Bate.*

## Trade Marks

*The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).*

**SILVER SCALES.**—665,135. Canned fish. **A. J. Mills and Company, Limited,** Colonial House, Tooley Street, London, S.E.1; Manufacturers.
**WISTARAN.**—668,712. Emulsions of edible oil in water, for use in the bakery trade. **William Stewart and Arnold, Limited,** 26 and 27, Conduit Street, London, W.1; Manufacturers.
**SYMPHONY.**—669,515. Edible oils. **Citrus Products Company, Limited,** Heather Park Drive, Wembley, Middlesex, and North Hillington Industrial Estate, North Hillington, Glasgow; Manufacturers.
**SCOPERMID.** — 669,718. Pharmaceutical substances for human use and for veterinary use; and infants' and invalids' foods. **Roche Products, Limited,** 40, Broadwater Road, Welwyn Garden City, Hertfordshire; Manufacturing Chemists.
**COUNTESS.**—669,779. Chocolate and non-medicated confectionery. **Charles Bond Limited,** Carlyle Road, Bristol, 5; Manufacturers.
**CROIX DU SUD.**—670,461. Dates. **Association Commerciale et Industrielle Nord-Africane** (a *Société à responsabilité limitée* registered under the laws of France), 5, rue de Chambery, Algiers; Merchants.

## New Companies

**English Refrigeration (London), Limited.** (465176.) High Holborn House, 52/4, High Holborn, W.C.1. To carry on business of refrigerator manufacturers and dealers, etc. Nom. cap.: £100 in £1 shares. Dir.: L. Kiernan, 24, Belsize Park Gardens, Belsize Park, N.W.3.

**"Stacatruc" Development, Limited.** (465208.) To carry on business of manufacturers of and dealers in mechanical handling equiment, industrial trucks, etc. Nom. cap.: £100 in 1s. shares. Dirs.: not named. Subs.: B. M. L. Fynn, 16, Sussex Place, Regent's Park, N.W.1 (acct.); R. T. Hartmann, 33, Hereford House, Park Lane, W.1 (co-dir.).

**Elan Valley Products, Limited.** (465234.) Spencer House, South Place, E.C.2. To carry on business of farmers, growers, and cultivators of and dealers in mushrooms, etc. Nom. cap.: £1,000 in £1 shares Dirs.: Lt.-Col. N. P. Dew, O.B.E., 1, Sloane Gardens, S.W.1; Lt.-Col. M. McLellan, Brooke Lodge, Chobham, Woking; P. Perry, Rhydoldog, Rhayader, Radnorshire.

**J. H. Nicholl and Son, Limited.** (465285.) 11, Peter Street, Manchester, 2. To carry on business of bakers, confectioners, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: D. B. Wilkinson, 120, Greenheys Lane, Greenheys, Manchester, 15; H. H. Wilkinson, 75, Darley Avenue, Manchester, 21.

**Dunn and Company (Sunderland), Limited.** (466487.) Mayfair Building, Sunderland. To carry on business of manufacturers of and dealers in materials required by manufacturers of cocoa, chocolate, or confectionery, etc. Nom. cap.: £100 in £1 shares. Dirs.: Sir Myers Wayman, Coanwood, Seaburn, Sunderland; G. Kemp, Sonachan House, By Dalmally, Argyllshire; W. S. Martin, Melrose, Thornholme Road, Sunderland; J. G. Rutherford and J. Stephenson.

**H. Dobrin and Company, Limited.** (466505.) 93, Cannon Street, London, E.C.4. To carry on business of manufacturers of and dealers in foods and provisions, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: H. Dobrin, 4, Barry Avenue, N.15; S. Rudolf, 117, Darenth Road, N.16.

**Davey-Singleton Products, Limited.** (466780.) Court Farm, Ebdon Road, Worle, Somerset. To carry on business of manufacturers of and dealers in foodstuffs of all kinds, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: E. F. Davey, Ashleighs, New Bristol Road, Worle, Somerset (mang. dir.); J. Singleton, 35, Hill Road, Worle; K. C. Collings and H. A. Ridler (all permt.).

*Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C. 2.*